Task 3.2

Quarterly Status Report # 3

for the project entitled

Dairy Best Available Technologies in the Okeechobee Basin

(SFWMD Contract No. C-11652)

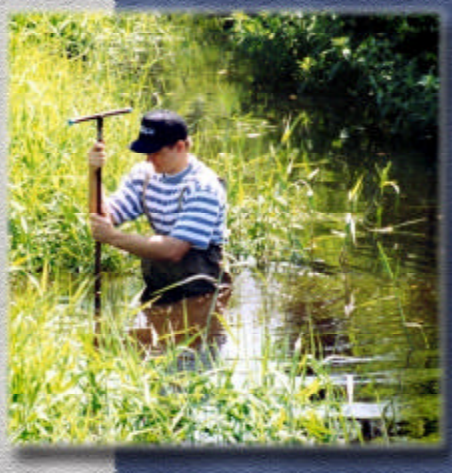
Submitted by

SWET, Inc.

Soil and Water Engineering Technology, Inc.

In Association With

MOCK•ROOS
CH2M HILL
ENTEL



February 12, 2003

The SWET Team

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Dairy Best Available Technologies in the Okeechobee Basin

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Introduction

This is the third quarterly status report for the Dairy Best Available Technologies (BAT) project. This report covers the period through December 31, 2002. The primary activities during this quarter have been completing the review process for the implementation plans, finalizing wetland construction permits issues, conducting routine monitoring, and analyzing the monitoring data. Table 1 shows the status of each individual task.

Monitoring Activities and Problems Encountered

Monitoring has continued successfully, but as noted in the previous status reports, flow measurement has been hampered by the sensitivity of the velocity meters being used to measure flow in the streams. The clear water and sediments on the transducers have caused significant noise in the data, but the introduction of the bubblers has helped the velocity measurements. Some of this noise has been filtered from the data during data processing, which is shown as the corrected velocity in the figures presented in Appendix A. Because the velocity readings were reduced by interferences, the filtering process used the maximum values recorded.

There are also periods when the velocity data are missed due to interferences. To account for missing data, velocity was estimated based on the correlation between velocity and stage during periods of valid readings. These adjustments greatly improved flow estimates, but some known problems still exist in the data. Discussions with District staff are underway for investigating other filtering techniques.

Analysis of Flow and Water Quality Data

The flow and water quality data for the monitoring sites has been analyzed (see Appendix A). Please refer to updated site maps in Appendix B for specific locations of monitoring sites.

Table 2 provides a summary of the estimated flow and phosphorus loads from the sites through the end of the quarter. As previously noted, the estimated flow volumes are subject to error.

Flow was recorded at all sites except for Site KREA 41, which had no flow during the period of record. Because the transducer at Site KREA 41 is approximately 2 feet below the overflow weir crest, the indicated small stages were never enough to cause flow. Therefore, the one water quality sample collected at the site was from stagnant water.

TABLE 1. STATUS REPORT
FOR
DAIRY BEST AVAILABLE TECHNOLOGIES PROJECT
December 31, 2002

TASK NO PHASE I	TASK / DELIVERABLES DESCRIPTION	SCHEDULED COMPLETION DATE	STATUS
1	**Development of Goals, Performance Measures and Potential Impacts**		
	1.1 Project Kick-Off Meeting	11/9/2000	Completed
	1.2 Devlop Draft Goals, Potential Impacts/Performance Measures and Evaluation Method	12/2/2000	Completed
	1.3 Conduct and Submit Literature/Data Search and Summary	1/2/2001	Completed
	1.4 Submit Final Goals, Potential Impacts/Performance Measure and Evaluation Method	2/2/2001	Completed
2	**Assessment and Selection of Project Sites**		
	2.1 Ranking and Selection of Dairy Sites	2/2/2001	Completed
	2.2 Development of Landowner Agreements	4/2/2001	Completed
	2.3 Develop and Submit Draft QAPP and Monitoring Plans	6/2/2001	Completed
	2.4 Formulate Technology Alternatives and Submit Draft Report	6/2/2001	Completed
	2.5 Finalize and Submit Final QAPP and Monitoring Plans for Existing Dairy Conditions	8/2/2001	Completed
	2.6 Finalize Technology Alternatives and Submit Final Report	8/2/2001	Completed
	2.7 Complete Evaluation of Alternatives and Submit Draft Report	9/2/2001	Completed
	2.8 Develop and Submit Draft CNMPs for the Three Selected Dairies	10/2/2001	Completed
	2.9 Prepare for and Conduct One Stakeholders Meeting	10/2/2001	Completed
	2.10 Finalize the Evaluation of Alternatives and Submit Final Report	11/2/2001	Completed
	2.11 Finalize the CNMPs for the Three Selected Dairies and Submit Final Report	11/2/2001	Completed
	2.12 Governing Board Presentation	11/2/2001	Completed
	STOP/GO DECISION POINT for Phase II		
PHASE II	(Requires Governing Board Approval)		
3	**Implementation and Monitoring of Alternatives**		
	3.1 Farm Level P Load Monitoring		
	3.1.1 Equipment purchase (up to a total of 9 sites)	11/2/2001	Completed
	3.1.2 Install and Test Monitoring Stations (9 stations assumed)	11/2/2001	Completed
	3.1.3 Conduct Routine Field Monitoring Activities - TP (52 Biweekly trips from RPB)	Starting 11/2/2001	Started 5/1/02
	3.1.4 Laboratory Analyses (assume 9 biweekly samples for 52 trips TP @$15/sam.)*	Starting 1/2/2002	Started 5/1/02
	3.1.5 Labor & Lab for 9 monthly samples for 24 mo. Fecal and TSS @ $45/sample *	Starting 1/2/2002	Started June, 2002
	3.2 Preparation and Submittal of Quarterly Reports	Starting 11/2/2001	Third Quarterly Report
	3.3 Develop Draft Vendor Project Documents, including bid specifications and agreements	1/2/2002	Completed
	3.4 Finalize Vendor Project Documents	3/2/2002	Completed
	3.5 Develop and Submit Draft Implementation Plan for Selected Technologies	3/2/2002	Completed
	3.6 Development of the Draft Monitoring Plan for Selected Technologies	3/2/2002	Completed
	3.7 Development of the Final Implementation Plan for Selected Technologies	5/2/2002	Waiting on comments from draft
	3.71 Cost of Implementing Vendor Technology (prepare & review bids)	5/2/2002	In Progress
	3.72 Review and Inspect Vendor Contruction Activities	Starting 5/2/2002	To be scheduled
	3.7.3 Vendor Payments	Starting 5/2/2002	To be scheduled
	3.8 Develop and Submit Final Monitoring Plan for Selected Technologies	Starting 5/2/2002	To be scheduled
	3.8.1 Equipment Purchase (up to a total of 6 sites)	6/2/2002	Completed
	3.8.2 Install and Test Monitoring Stations (Assumed 6 additional stations)	6/2/2002	To be scheduled
	3.8.3 Conduct Routine Monitoring Activities - TP (34 Biweekly trips from RPB)	Starting 8/2/2002	To be scheduled
	3.8.4 Laboratory Analyses (assume 6 TP samples @ $15/sample)*	Starting 8/2/2002	To be scheduled
	3.9 Prepare for and Attend Bi-annual Site Meeting (5 qtrs)	Starting 8/2/2002	To be scheduled
	3.10 Prepare for and Conduct Public Workshop	11/2/2002	To be scheduled
	3.11 Submit Workshop Minutes	12/2/2002	To be scheduled
4	**Evaluation of Alternatives Perforance**		
	4.1 Prepare and Submit Draft Final Report	9/2/2003	To be scheduled
	4.2 Prepare for and Conduct Public Workshop	10/2/2003	To be scheduled
	4.3 Prepare and Submit Final Report and Associated Project Data	11/2/2003	To be scheduled
	4.4 Prepare and Submit Workshop Minutes	11/2/2003	To be scheduled
	Total for Project	**11/2/2003**	

Table 2. Summary of Flow and P Concentration Data for Dairy BAT Monitoring Sites (April, 2002 through December 31, 2002)

Dairy Name	Davie Dairy			Butler Oak Dairy				Dry Lake Dairy	
Site Name	Davie South	Davie North	Davie East	KREA 41	KREA 41A	KREA41B	KREA10D	KREA 32B	KREA 49A
Volume (ac-in)	9277	1310	4973	0	6606	14	2472	736	693
Runoff (in)	5.86	4.04	15.35	0.00	3.09	0.18	1.36	1.91	2.31
Area (ac)	1583	324	324	0	2141	81	1821	386	300
P load (lbs)	2453	1027	382	0	1441	15	429	537	689
Flow Avg P (ppm)	1.17	3.46	0.34	4.48	0.96	4.50	0.76	3.22	4.39

The phosphorus data (FigureA27) are consistent with District data measured at the same locations. The phosphorus data are also presented on the flow plots Figures (A3 to A26) to show the sample compositing period and how the phosphorus concentrations relate to flow. Fecal coliform levels (Figure A28) are generally very low except for a few sites (note, site KREA 32B had a very high single spike) that have animal grazing around or just upstream of the site. At most of the sites, the level of total suspended solids (TSS) levels are low (Figure A29), but are similarly correlated with nearby animal grazing.

The equipment blanks analyzed as part of the quality assurance program were all below detectable limits, which indicate excellent field protocol. The results from all duplicate samples were within 4% of each other.

Vendor Progress

The vendors have completed 100% designs for the three dairies. These designs were included in the Implementation Plan that is being reviewed by the TRT. The vendors and their contractors are ready to start construction as soon as approvals from the dairymen and District are received. A summary of the costs by the vendors to date is provided in Table 3. MWBE forms have been submitted as required. All of the costs have been for surveying, environmental assessments, and engineering. These activities are nearly complete, and therefore the remainder of the vendor budget will be predominantly for construction. It is anticipated that approval for construction will be received by March, 2003. Construction is expected to begin by mid April 2003 and is scheduled to be completed by July 30, 2003. Table 4 provides an adjusted project schedule.

Permitting Issues

The Army Corps of Engineers (ACOE) permits for construction in wetlands for Dry Lake Dairy has been received and Ms. Irene Sadowski (ACOE) indicated that the Davie Dairy permit would be issued shortly.

At the Butler Oaks dairy, the permit for moving the gopher tortoises expired and had to be resubmitted with a new field survey having to be conducted. This will be completed prior to the start of construction.

One final permitting note, the stormwater treatment standard, which covers the edge-of-farm treatment systems being built as part of this project, has been temporarily approved by NRCS and can be now be used. When the temporary approval status is changed to permanent status is unknown.

Table 3. Invoiced Expenditures for Vendors through October 15, 2002

Vendor Name	Percentage Completion	Invoiced through October 15, 2002
Engineering & Water Resources, Inc.	19.5	$112,290.94
CDM	20.8	$119,522.34
Environmental Research & Design	16.3	$93,721.46
Total	**18.9**	**$325,534.74**

Table 4. EOF Implementation Schedule

Tasks	Schedule 2003						
	Jan	Feb	Mar	Apr	May	June	July
Construction approval							
Construction permits obtained							
Final construction drawings							
Start of construction							
Construction							
Substantial completion							
Completion of construction							
Monitoring plan and installation							
Monitoring started							

APPENDIX A

FLOW AND WATER QUALITY DATA FOR MONITORING SITES

List of Figure

Figure A-1. Davie North - Stage

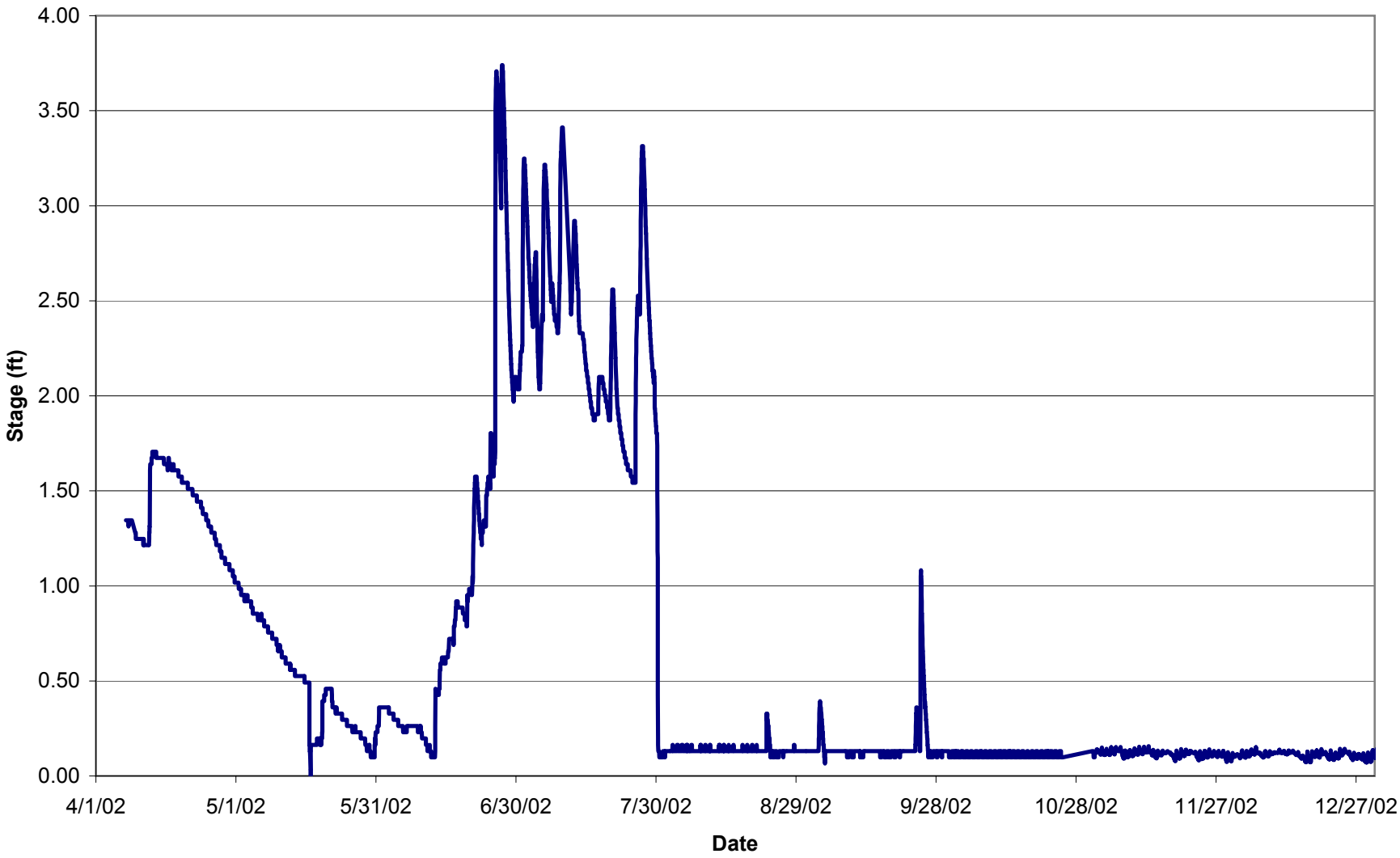


Figure A-2. Davie North - Velocity

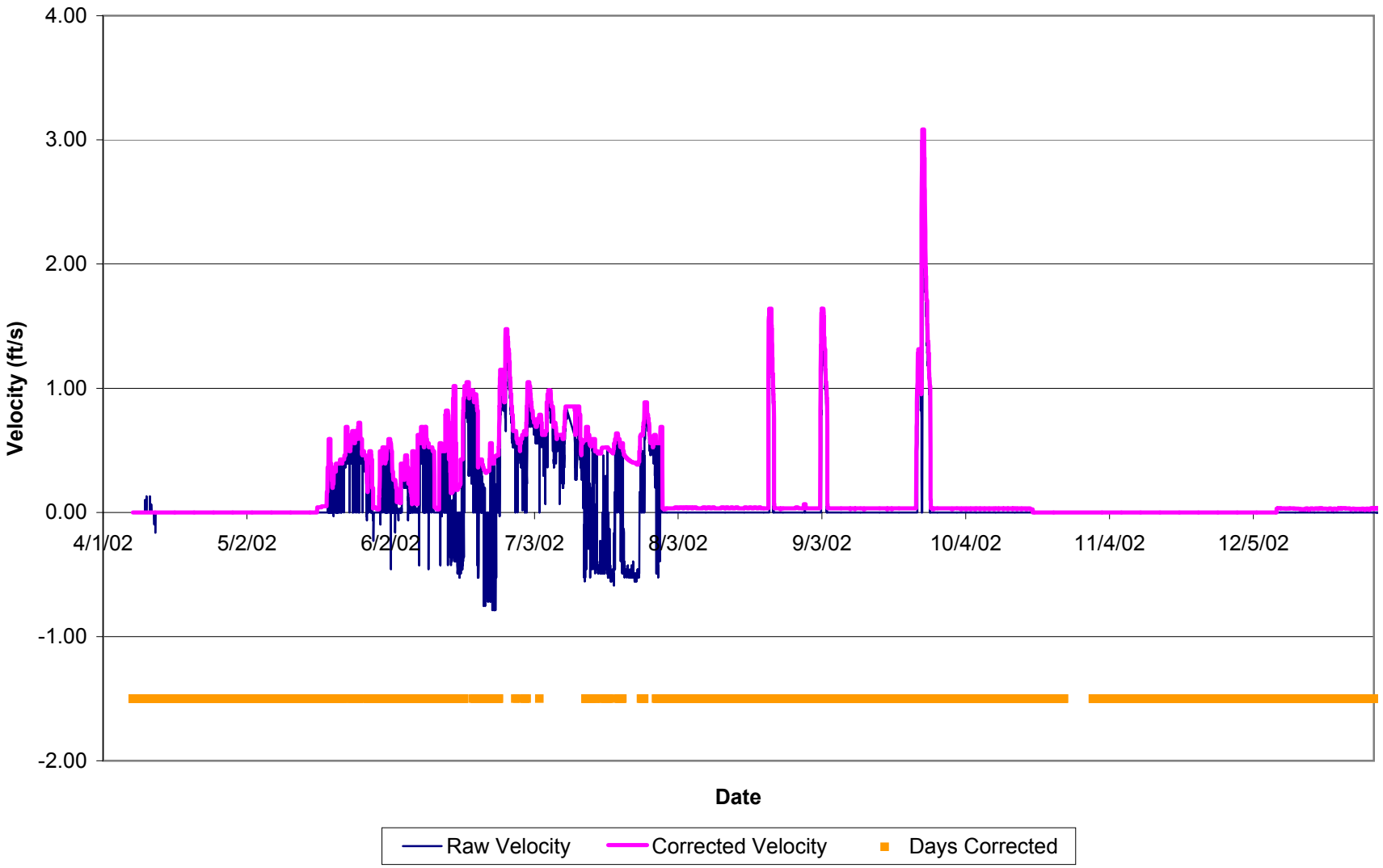


Figure A-3. Davie North - Flow and P Concentration

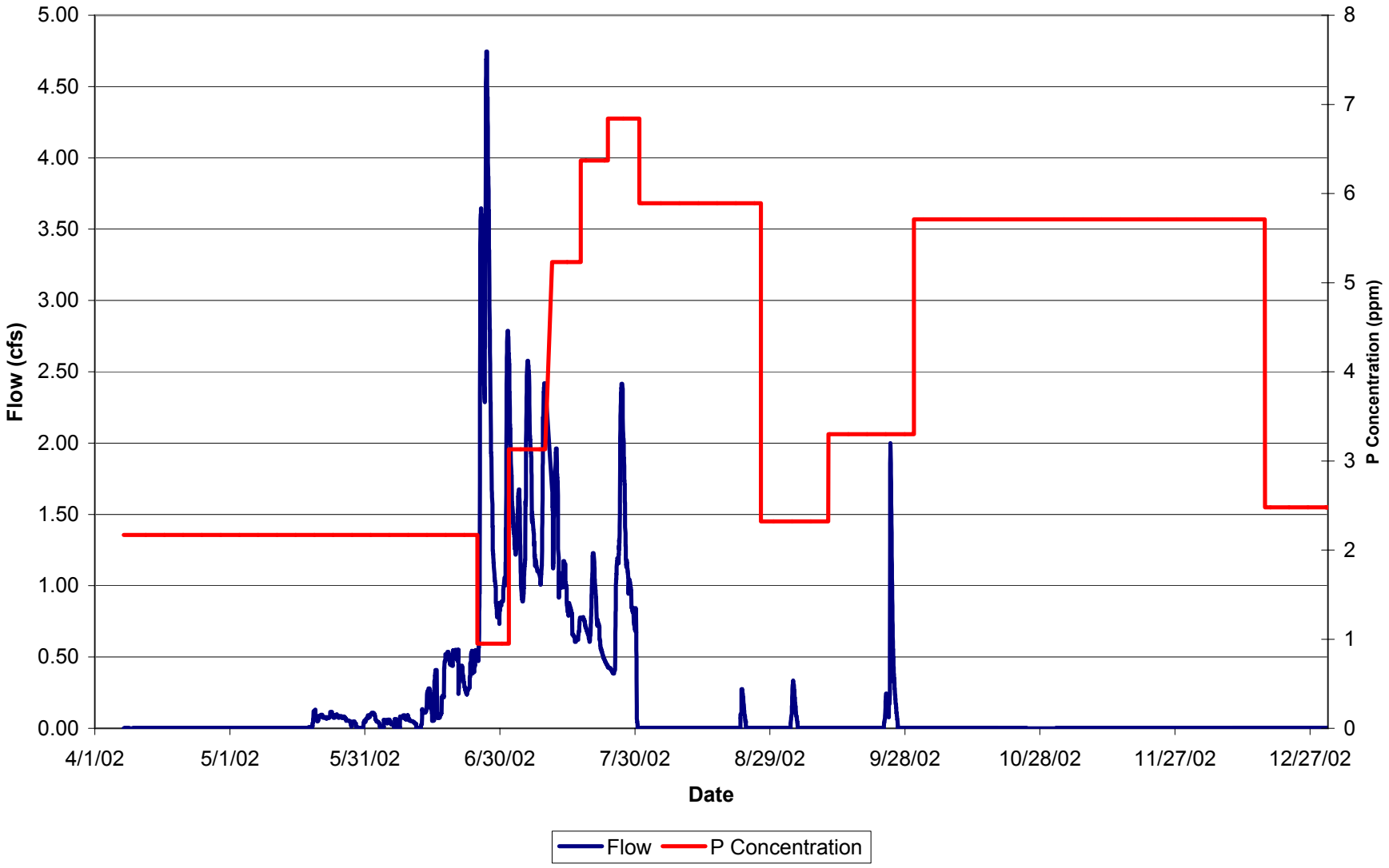


Figure A-4. Davie East - Stage

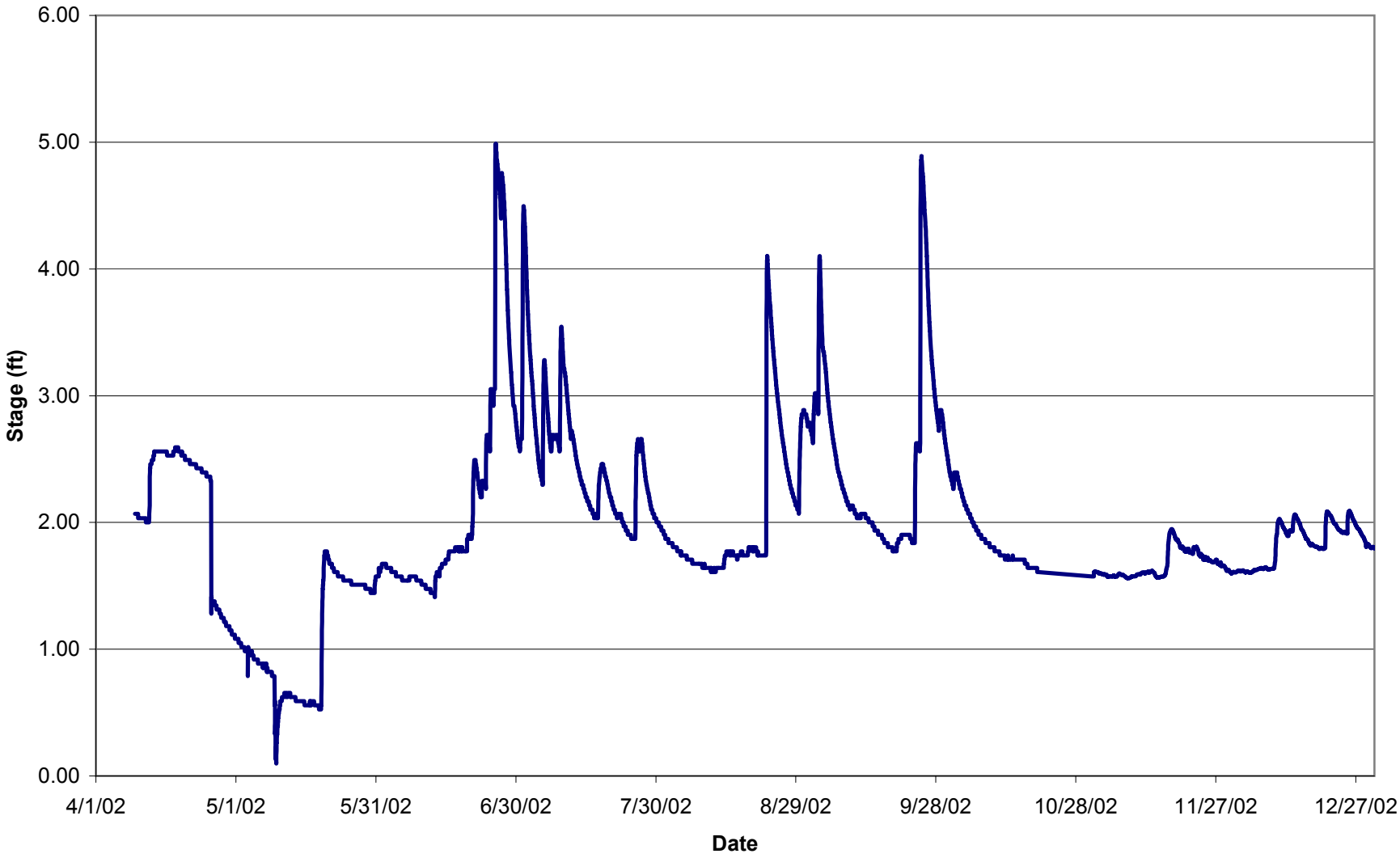


Figure A-5. Davie East - Velocity

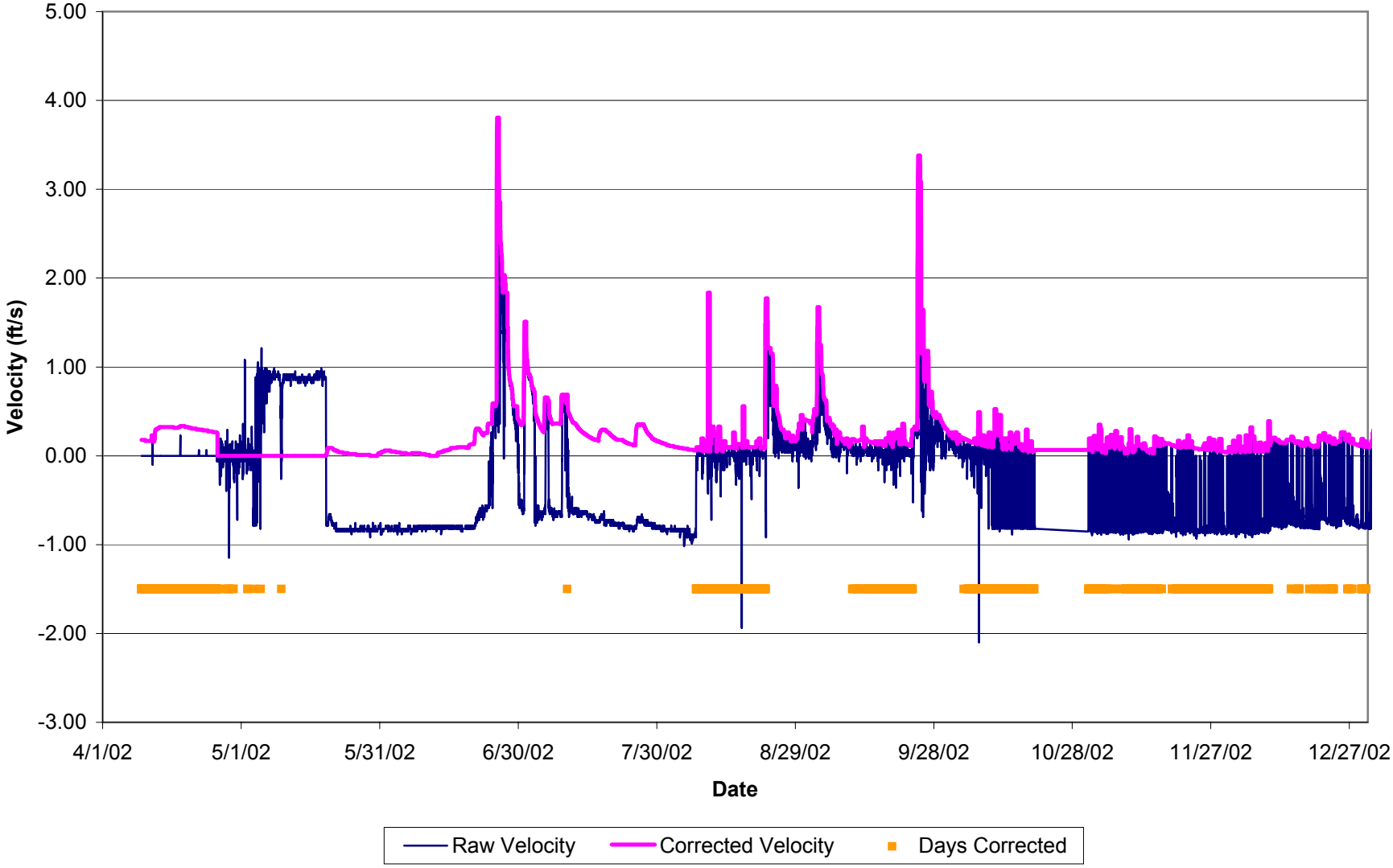


Figure A-6. Davie East - Flow and P Concentration

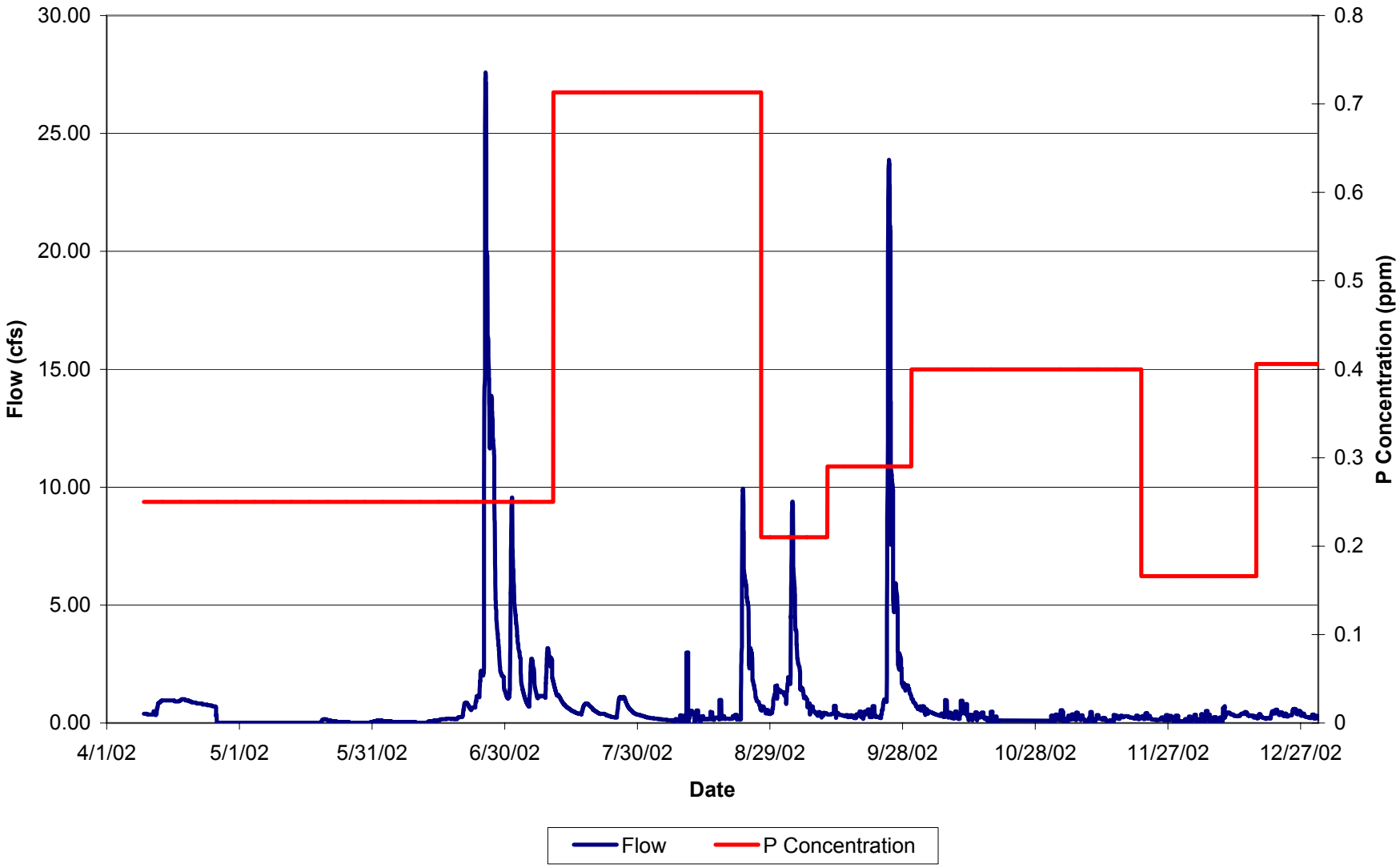


Figure A-7. Davie South - Stage

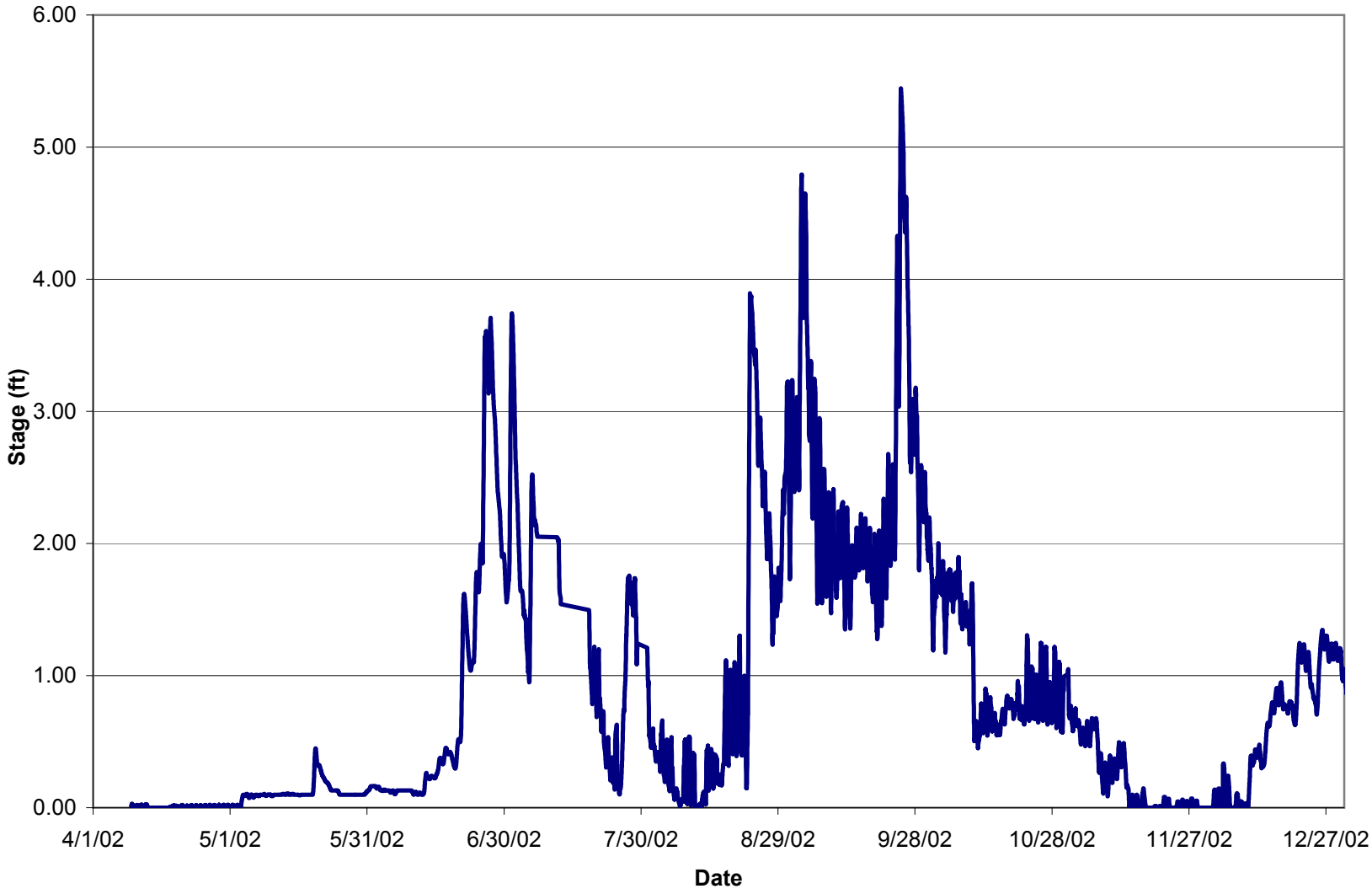


Figure A-8. Davie South - Velocity

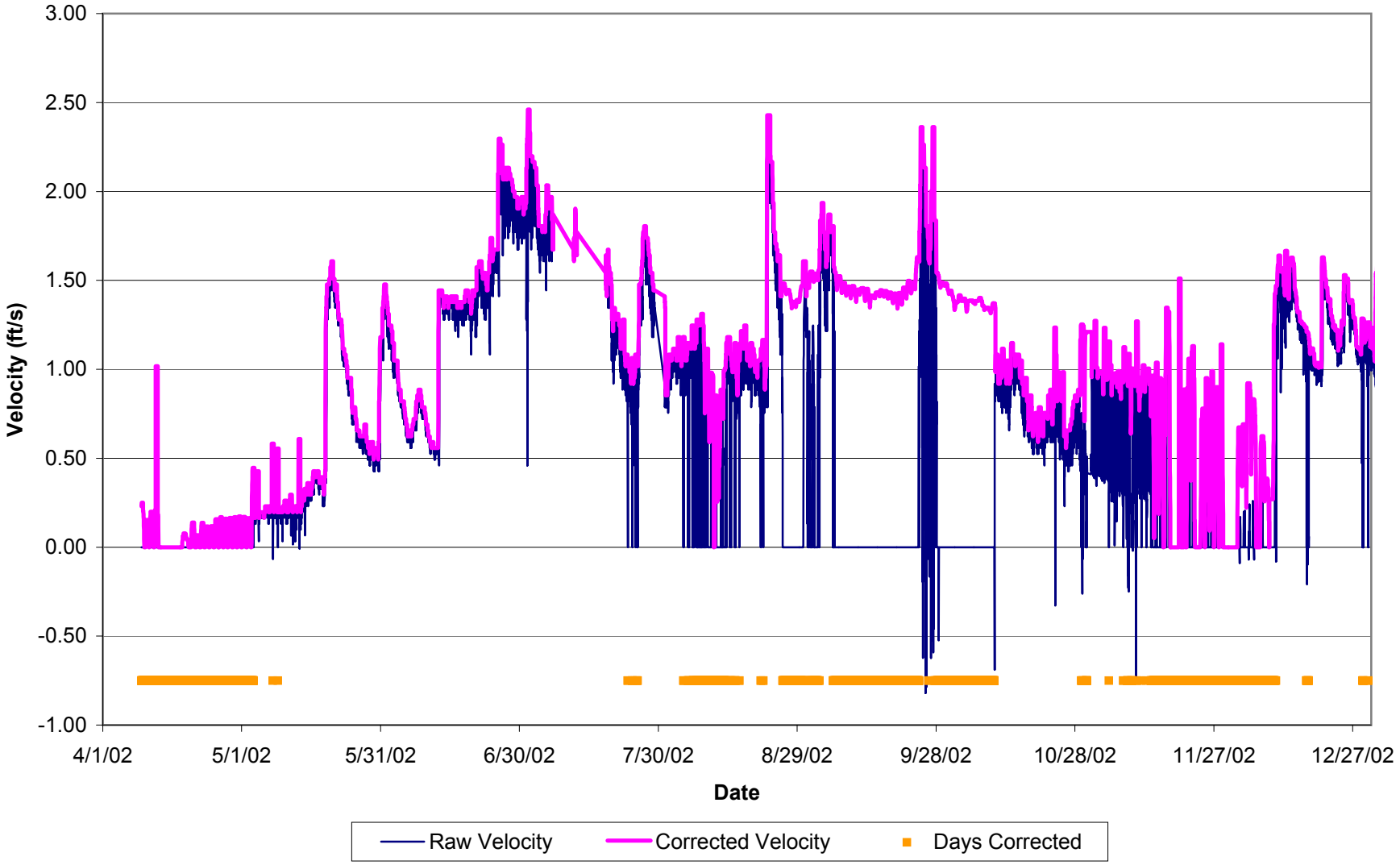


Figure A-9. Davie South - Flow and P Concentration

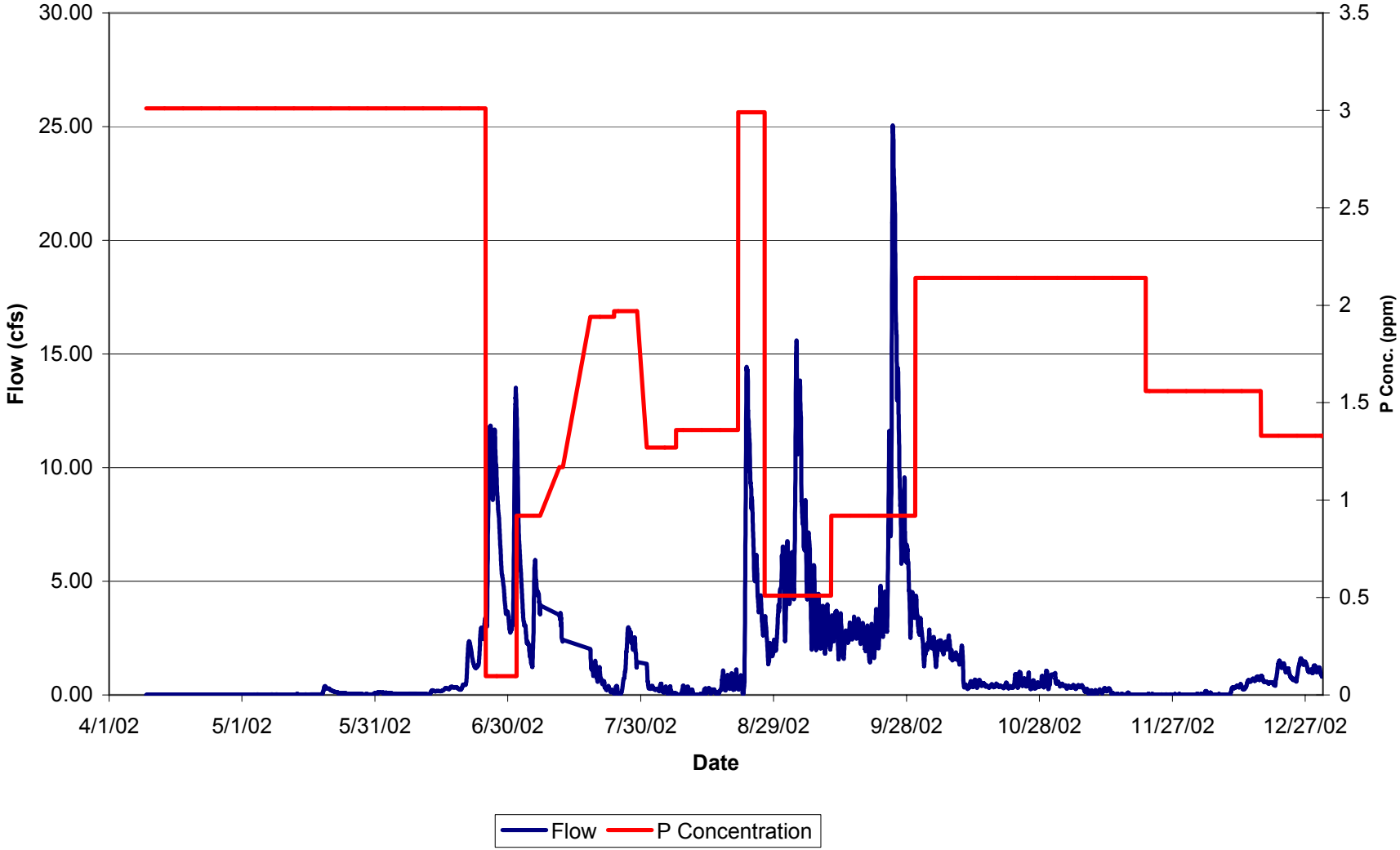


Figure A-10. KREA 41 - Stage

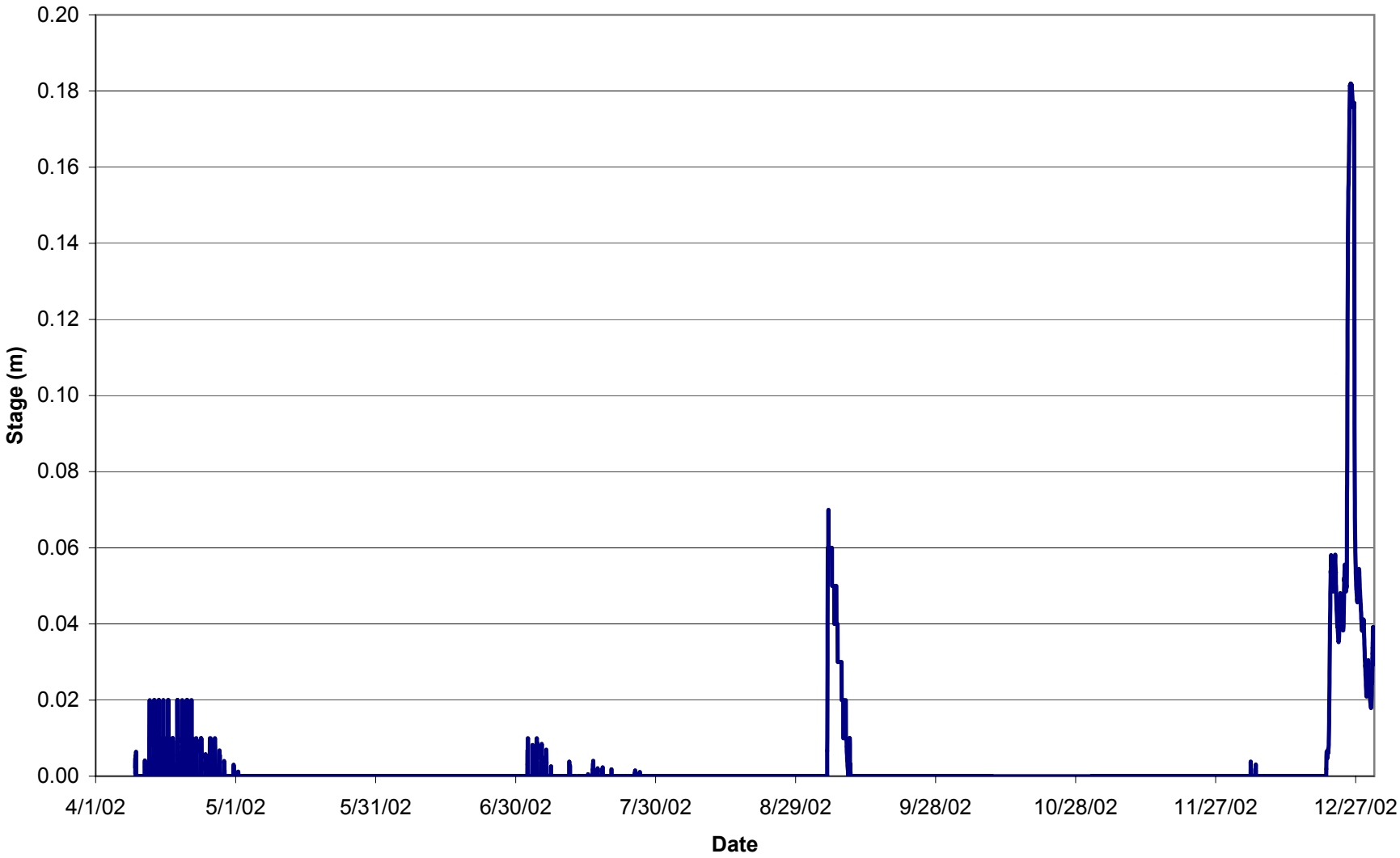


Figure A-11. KREA 41 - Velocity

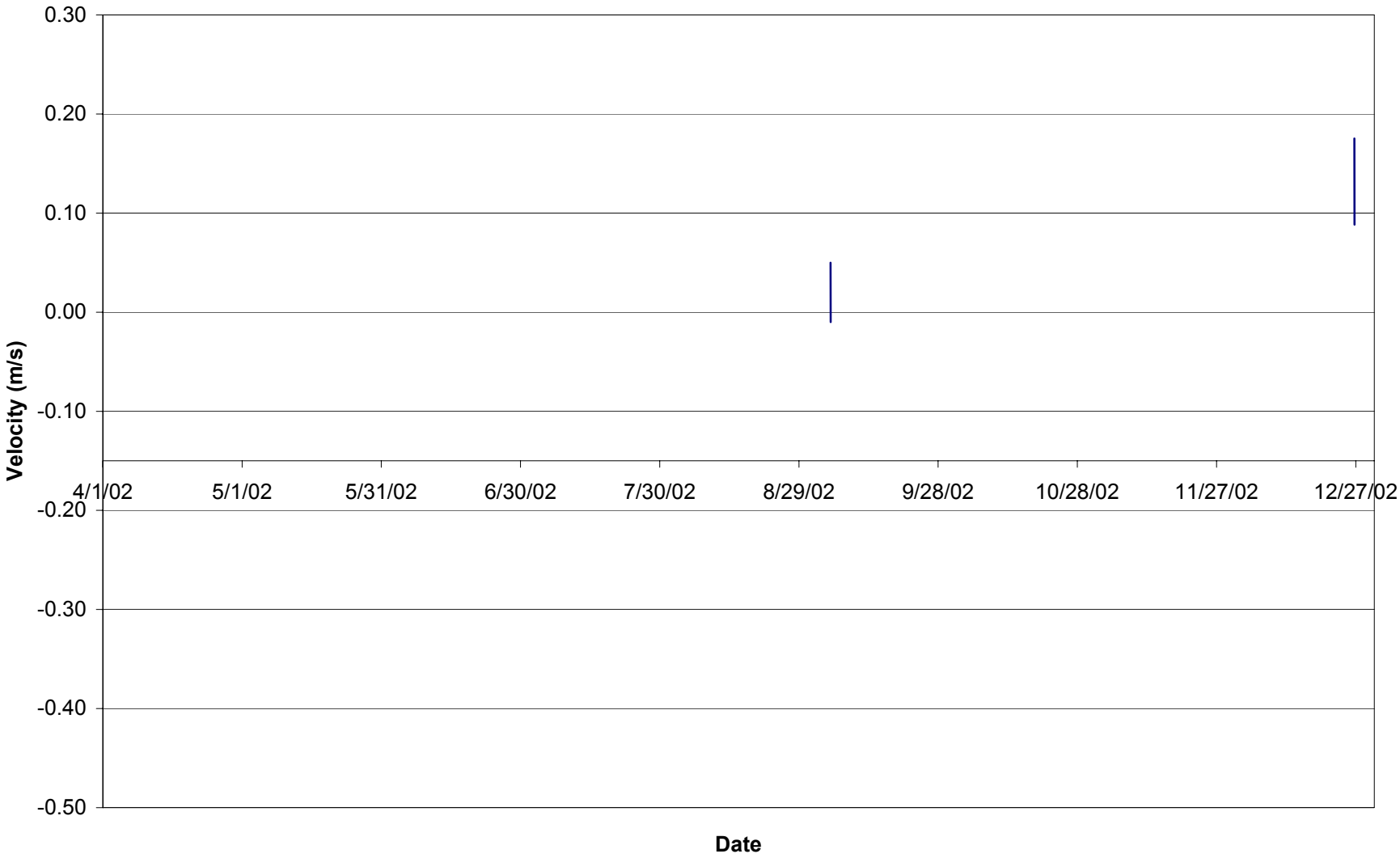


Figure A-12. KREA 41A - Stage

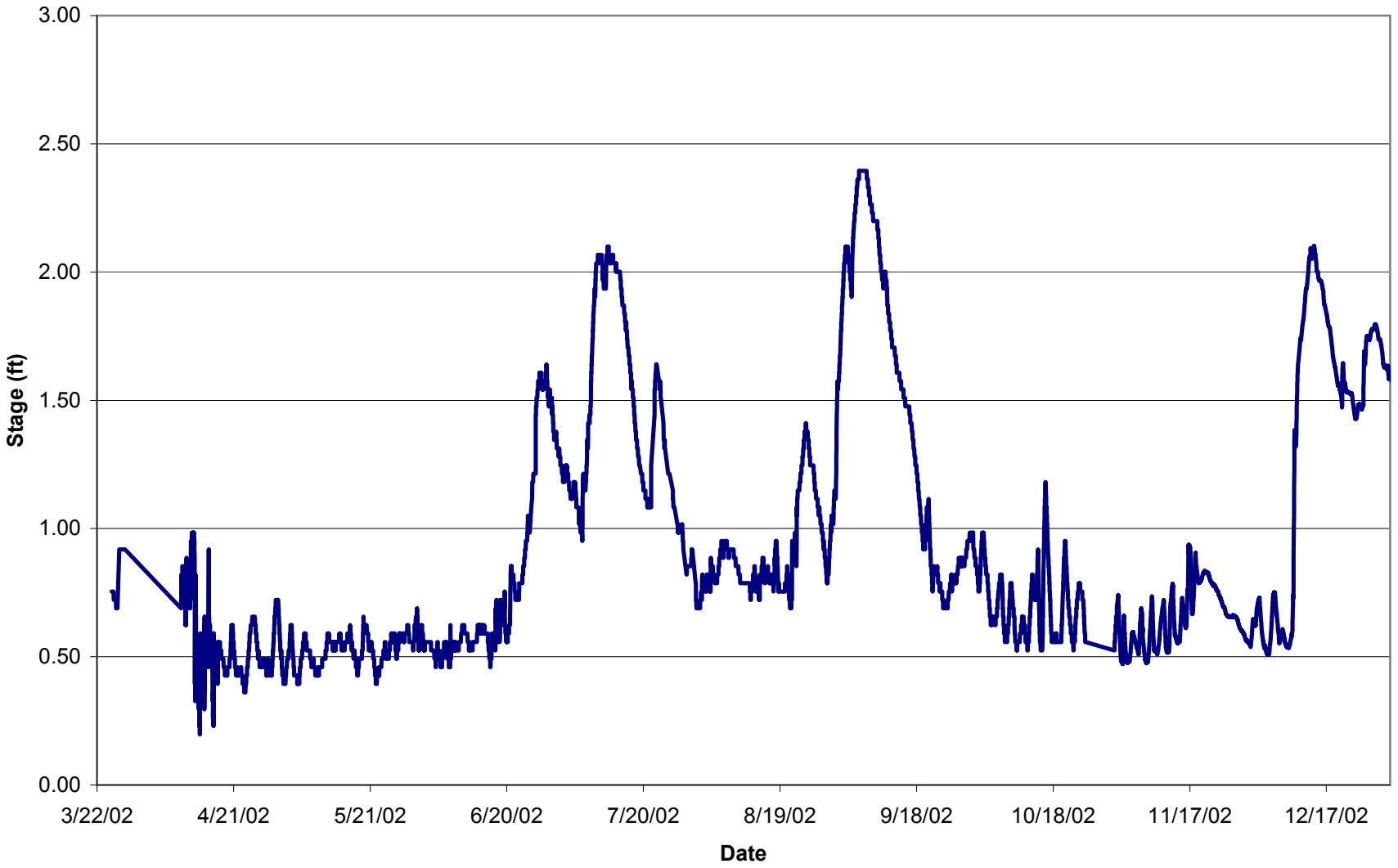


Figure A-13. KREA 41A - Velocity

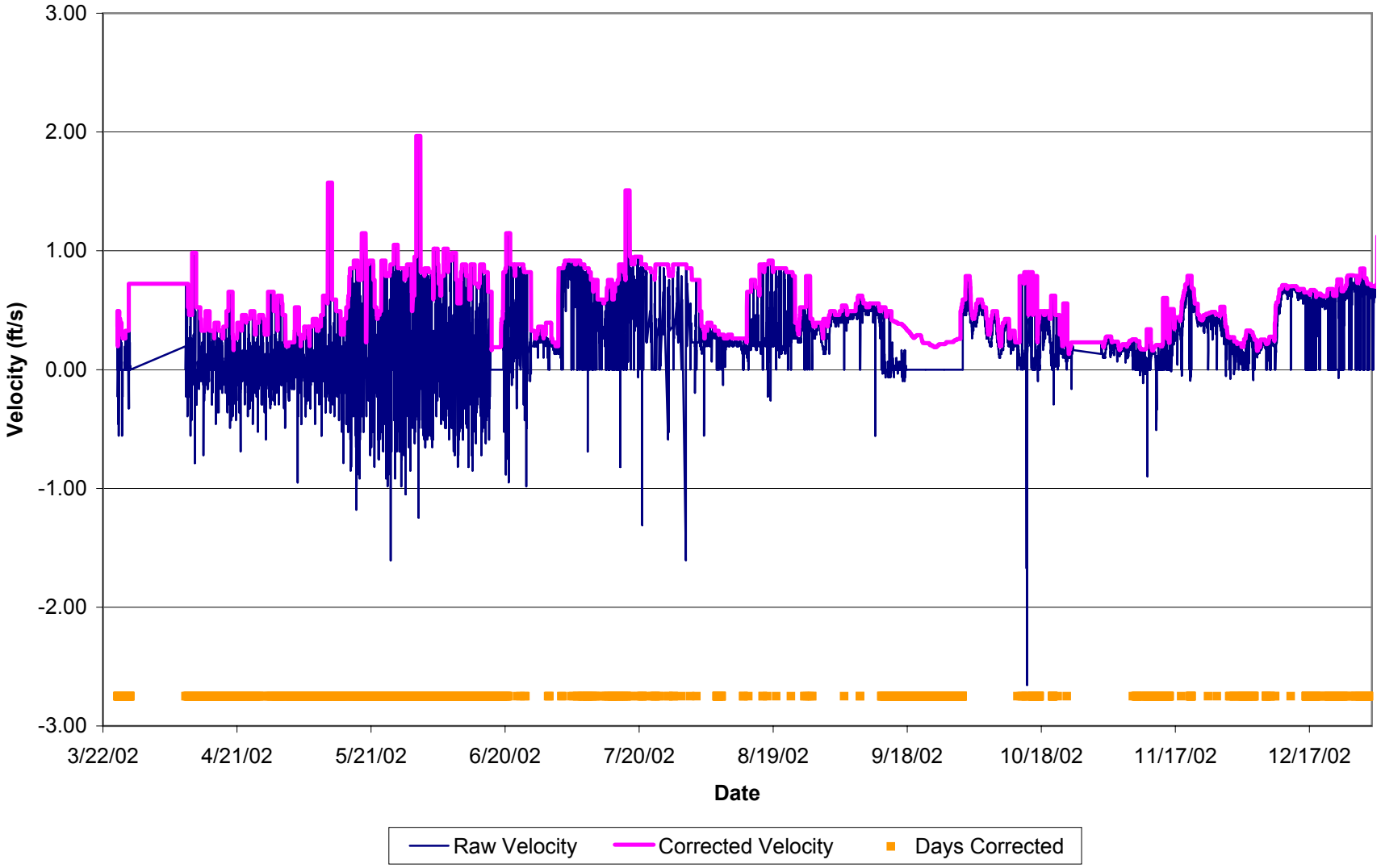


Figure A-14. KREA 41A - Flow and P Concentration

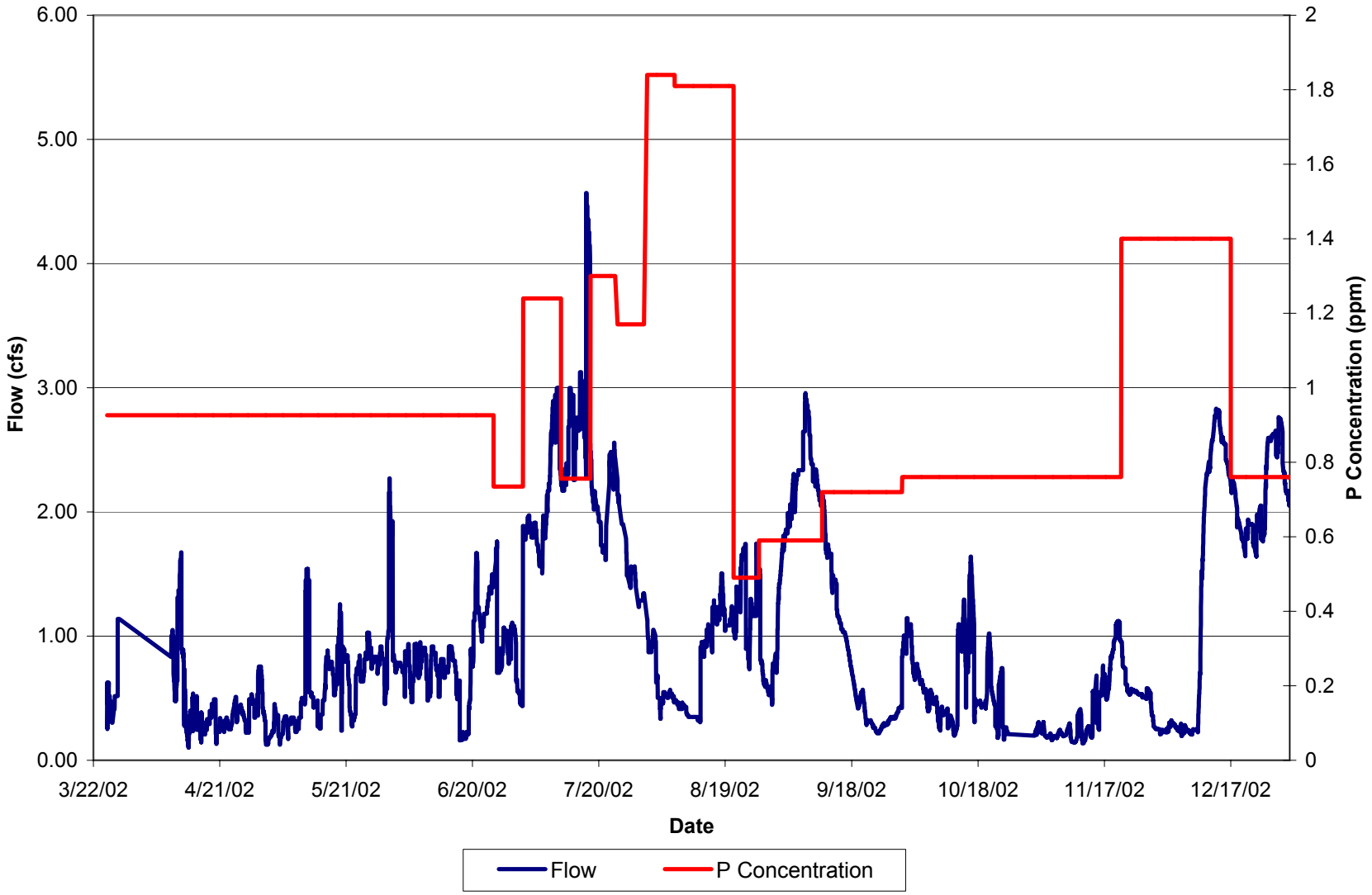


Figure A-15. KREA 41B - Stage

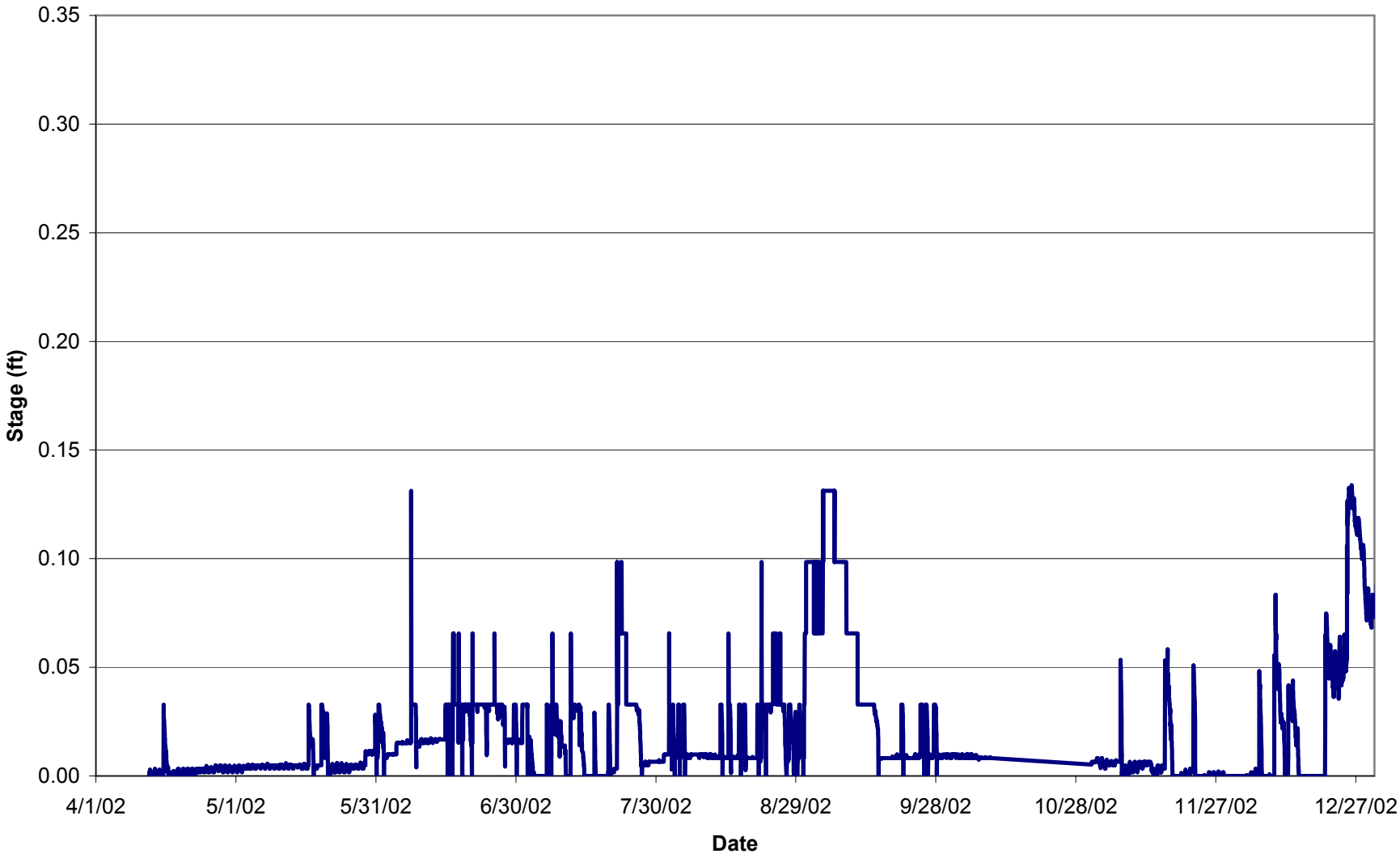


Figure A-16. KREA 41B - Velocity

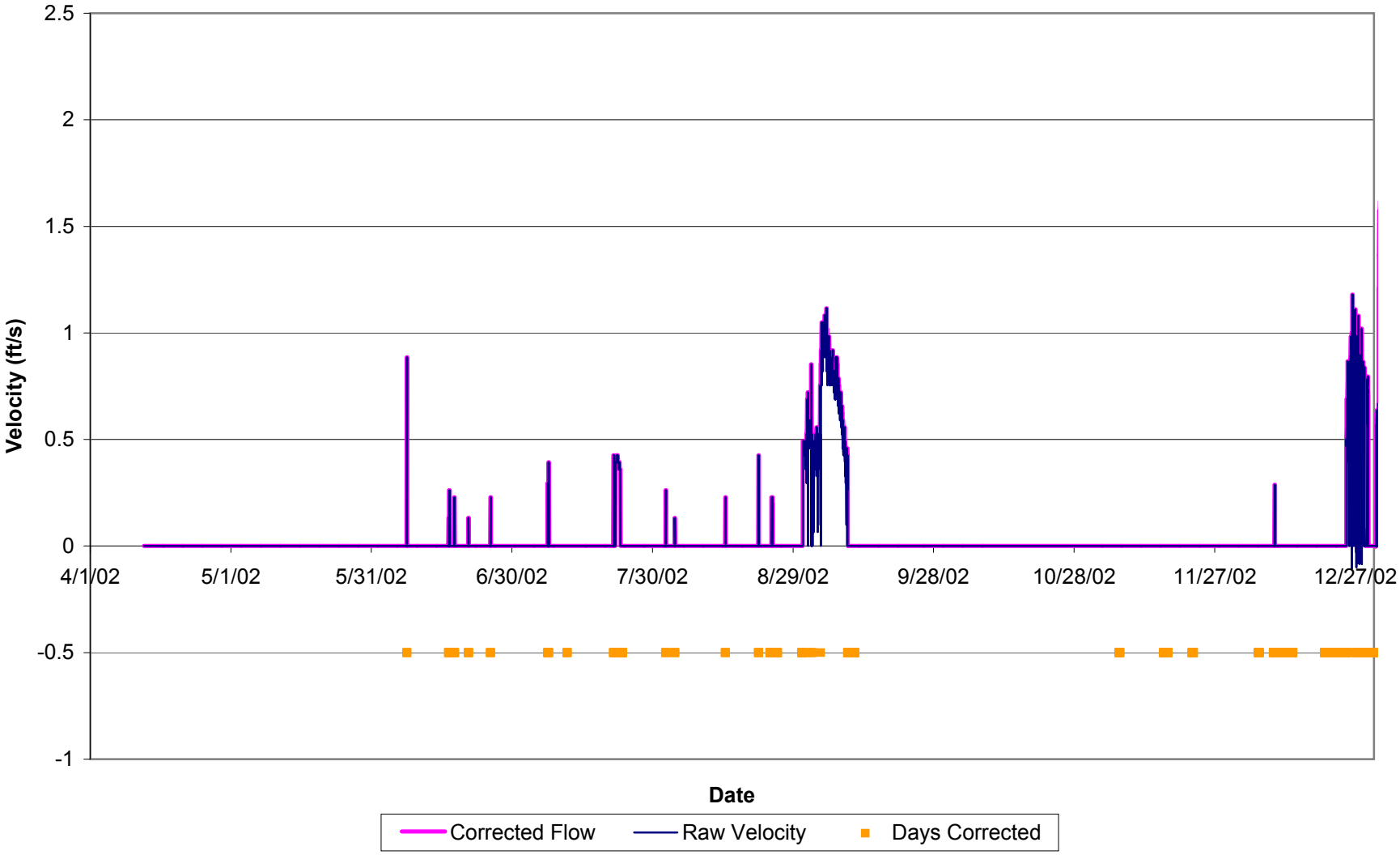


Figure A-17. KREA 41B - Flow and P Concentration

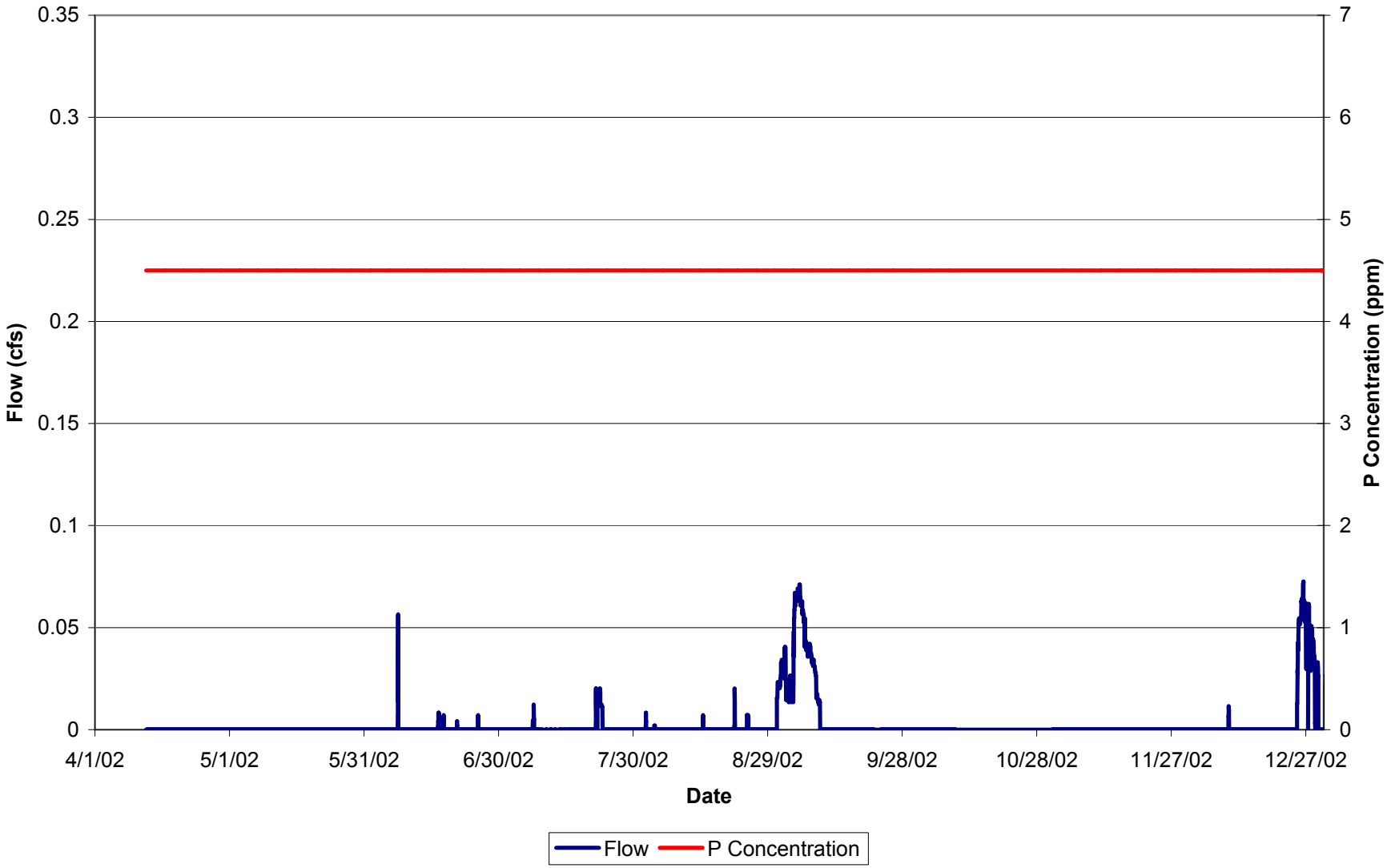


Figure A-18. KREA 10D - Stage

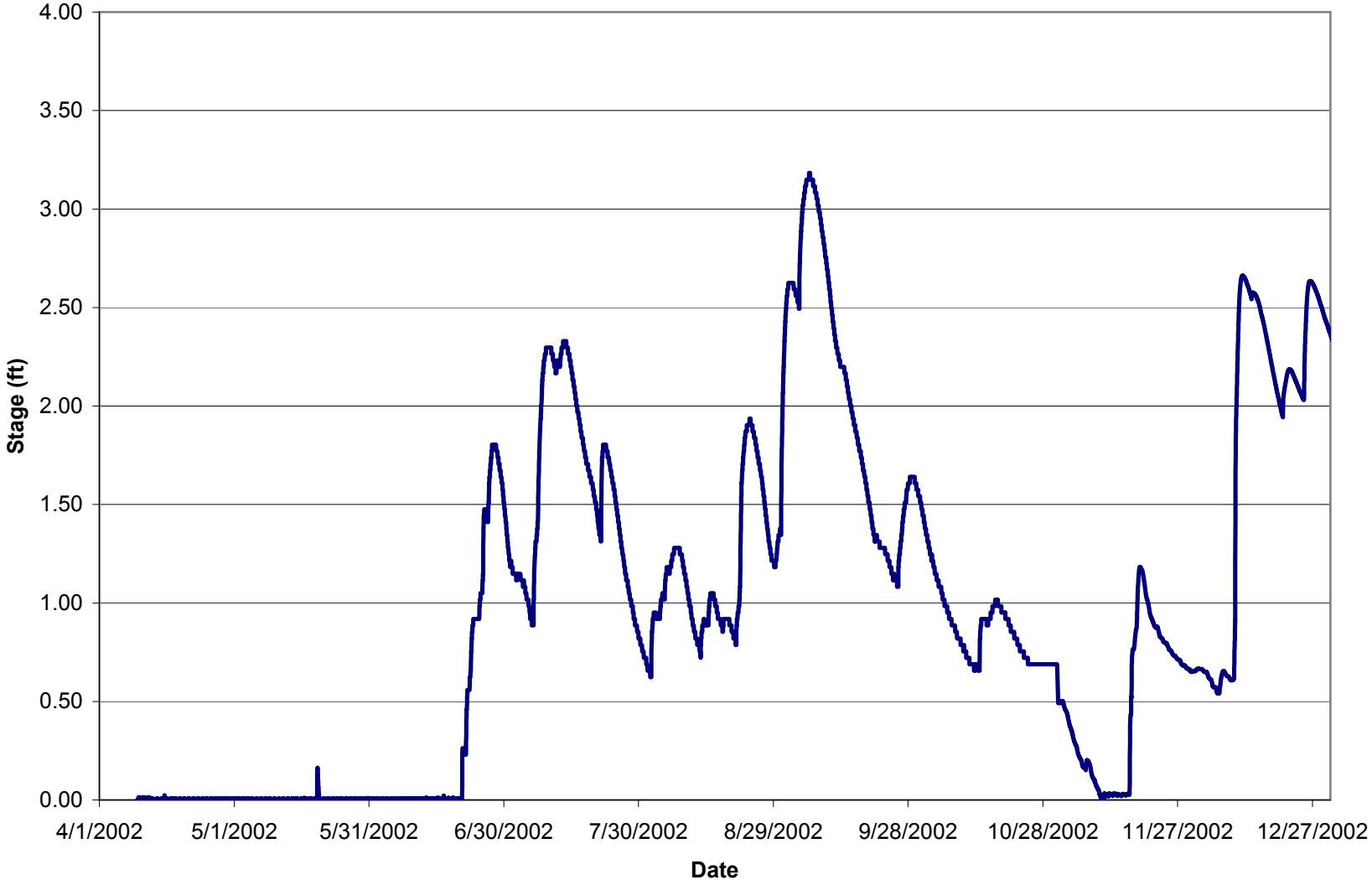


Figure A-19. KREA 10D - Velocity

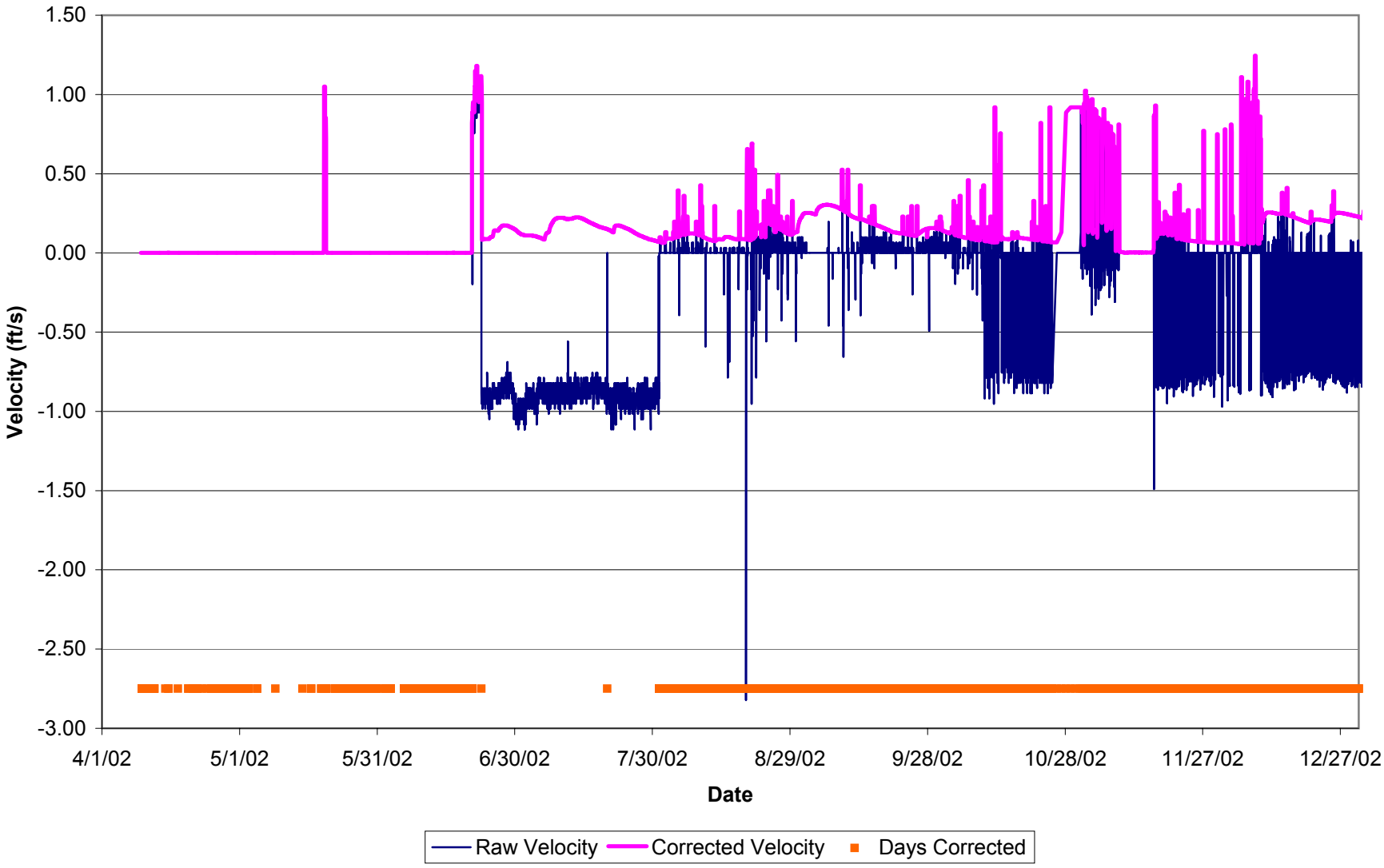


Figure 20. KREA 10D - Flow and P Concentration

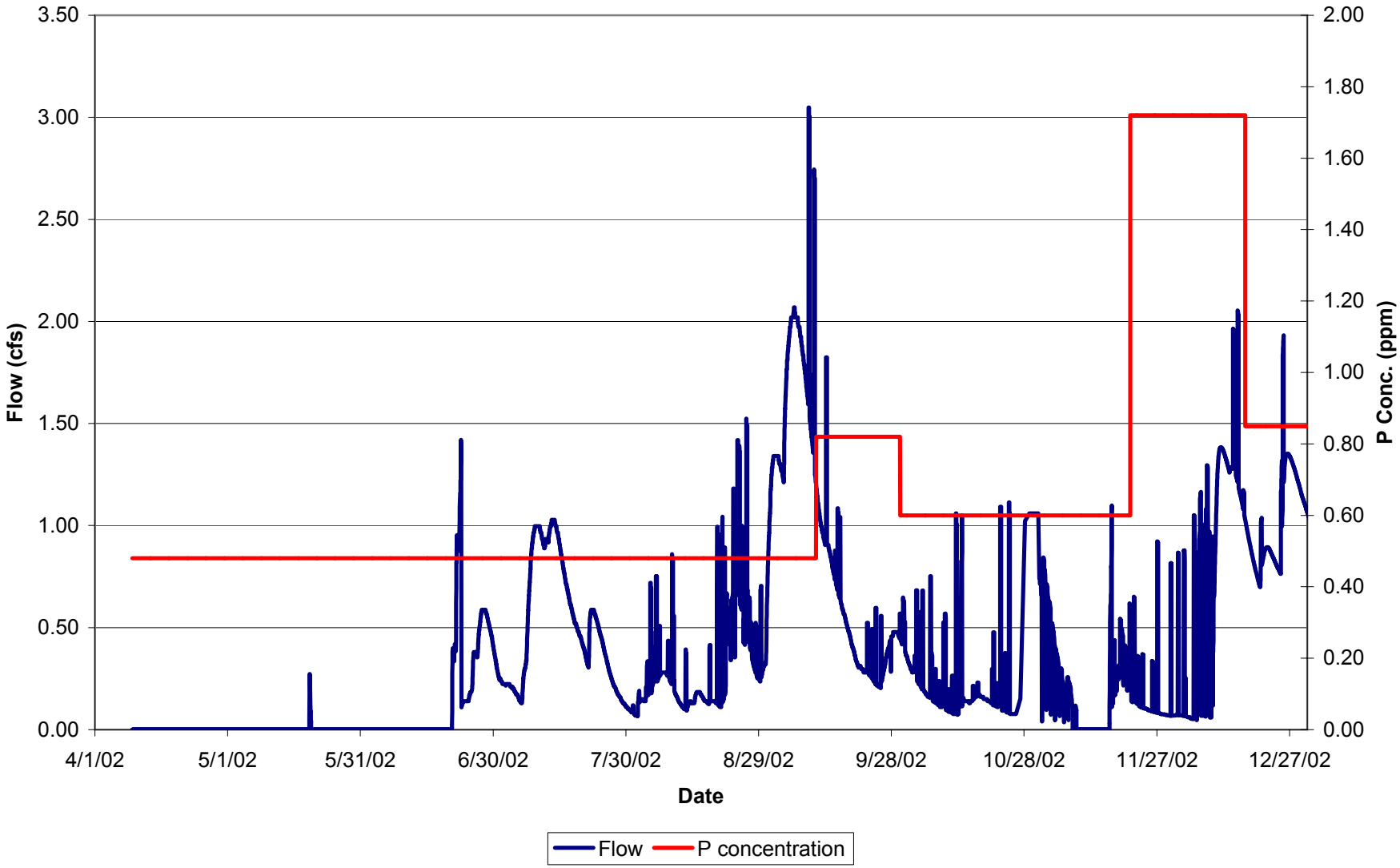


Figure A-21. KREA 32B - Stage

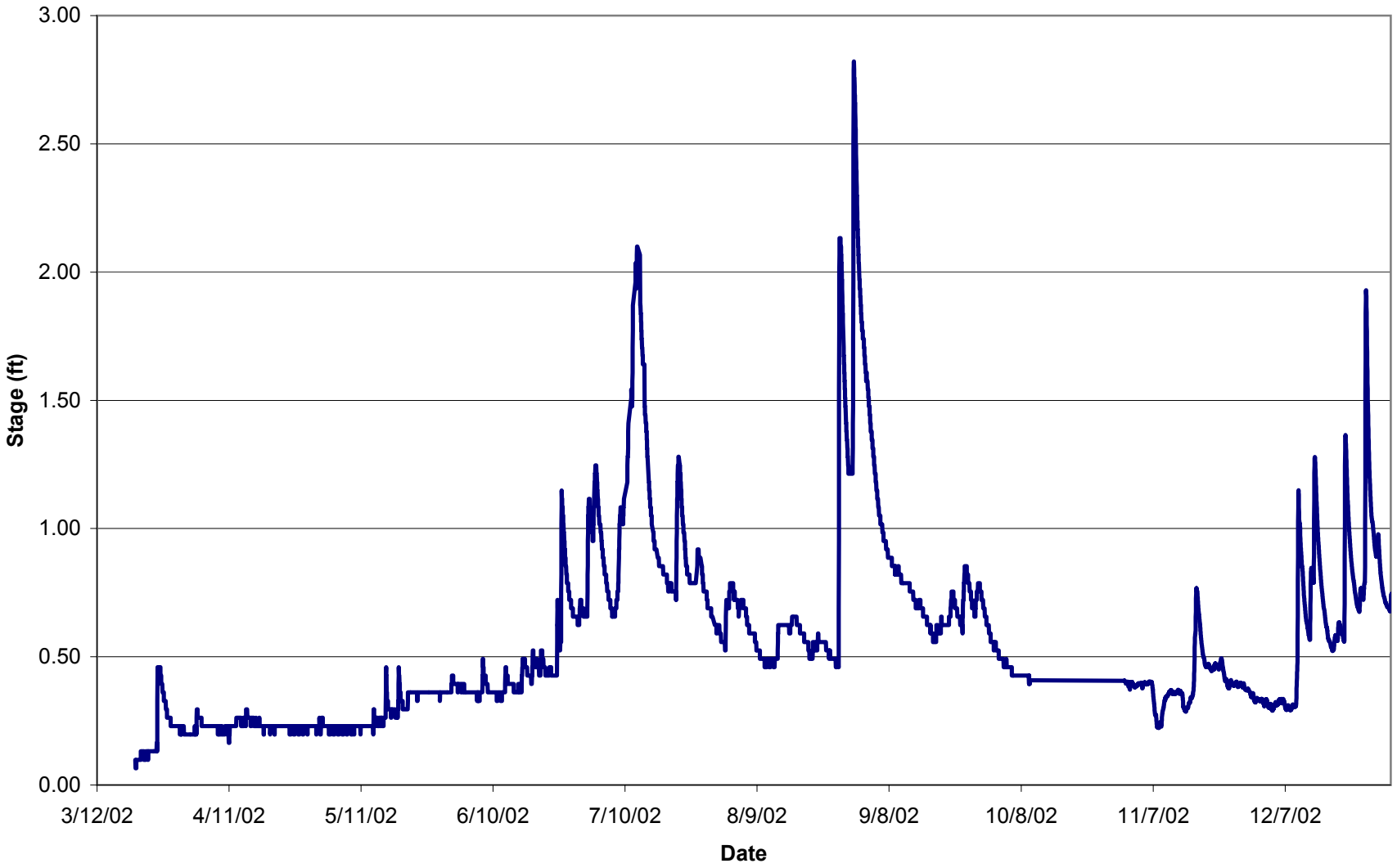


Figure A-22. KREA 32B - Velocity

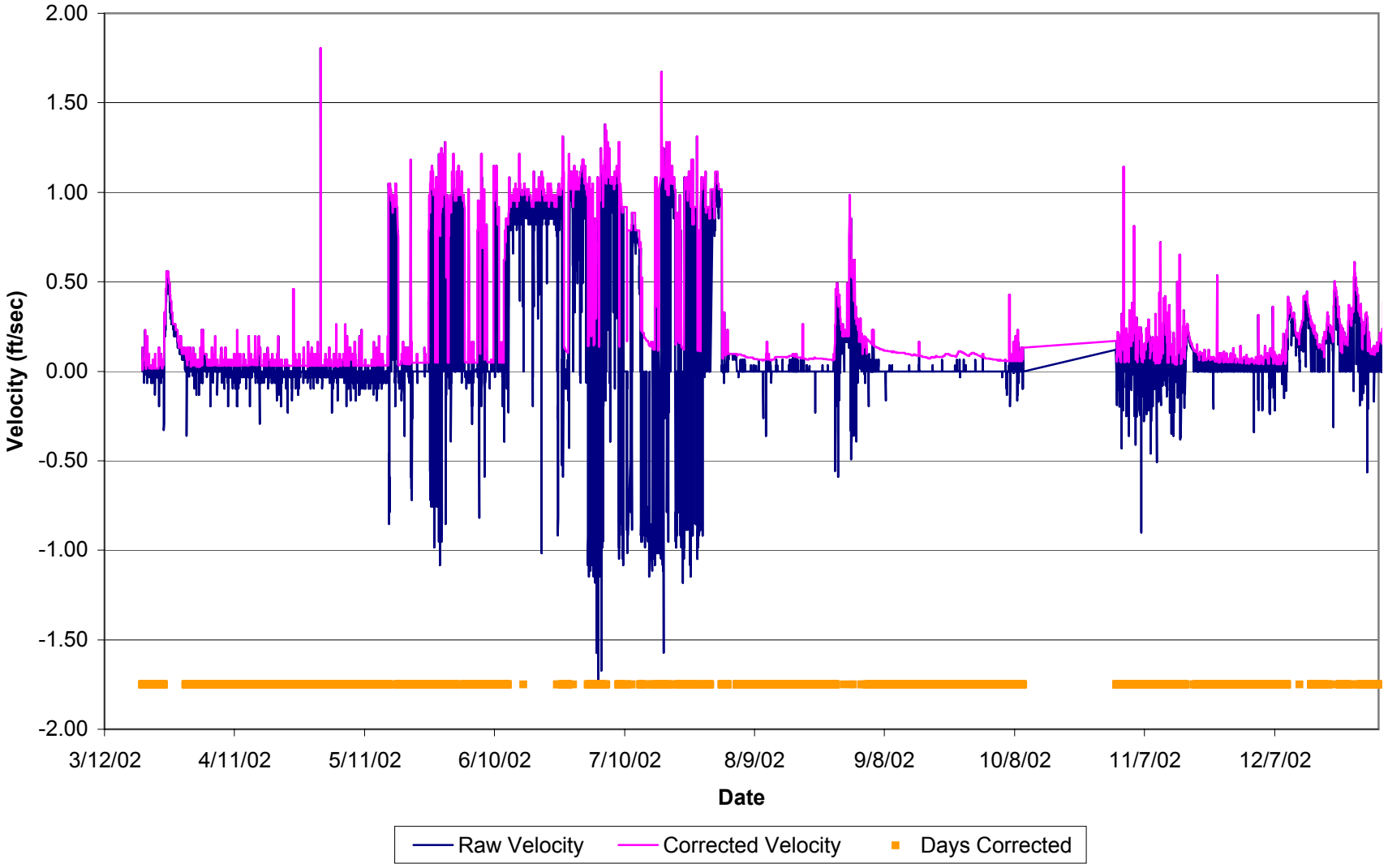


Figure A-23. KREA 32B - Flow and P Concentration

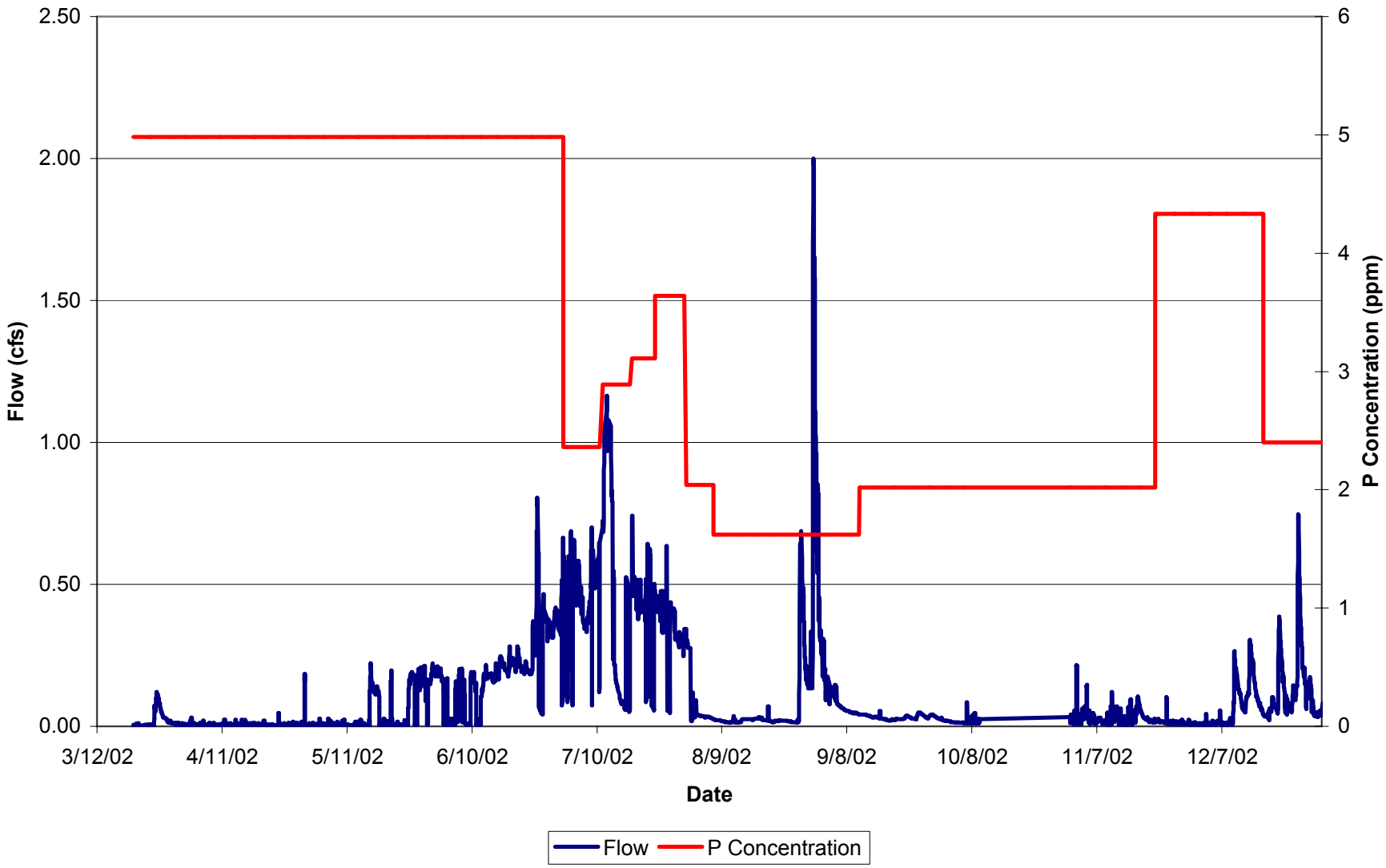


Figure A-24. KREA 49A - Stage

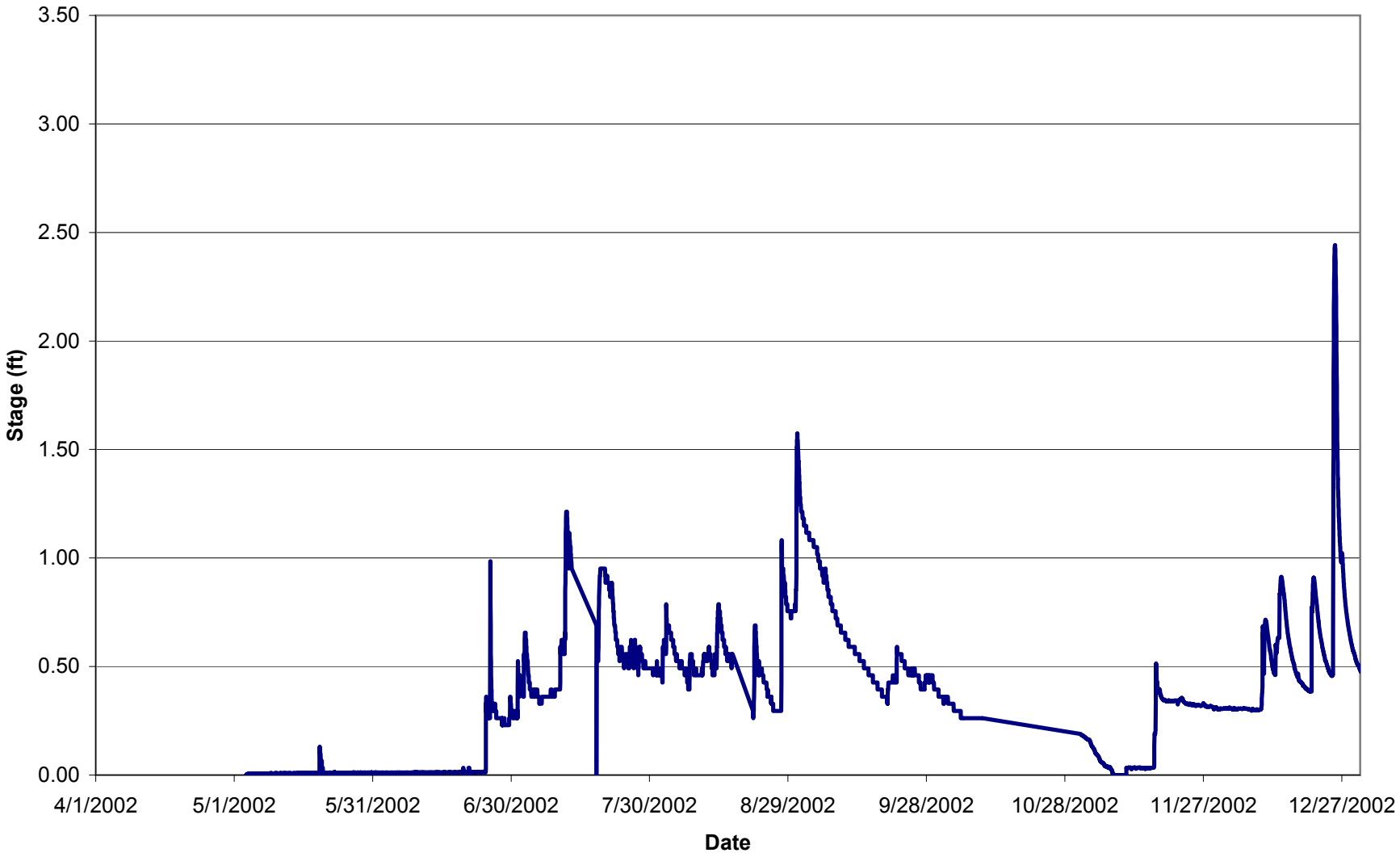


Figure A-25. KREA 49A - Velocity

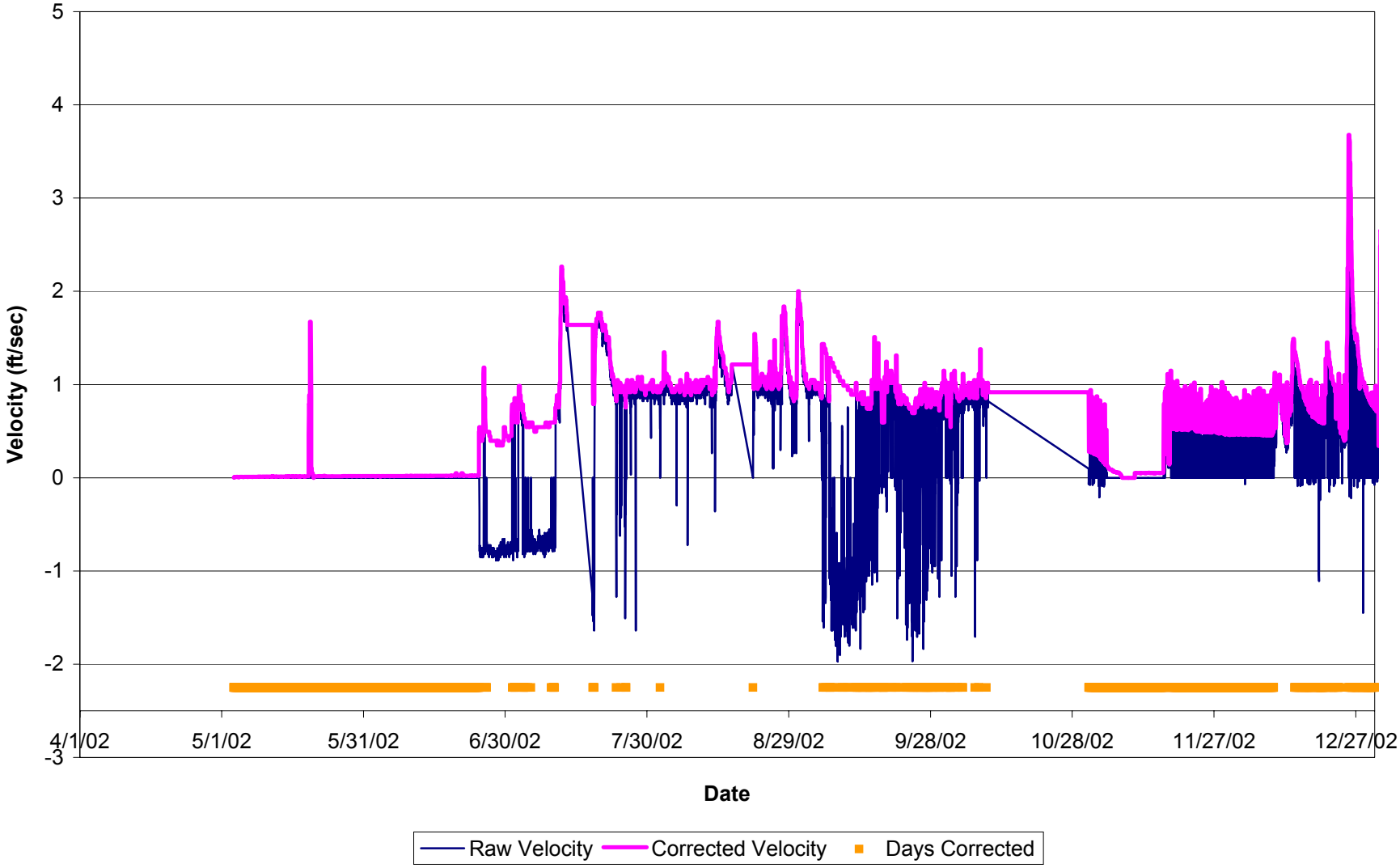


Figure A-26. KREA 49A - Flow and P Concentration

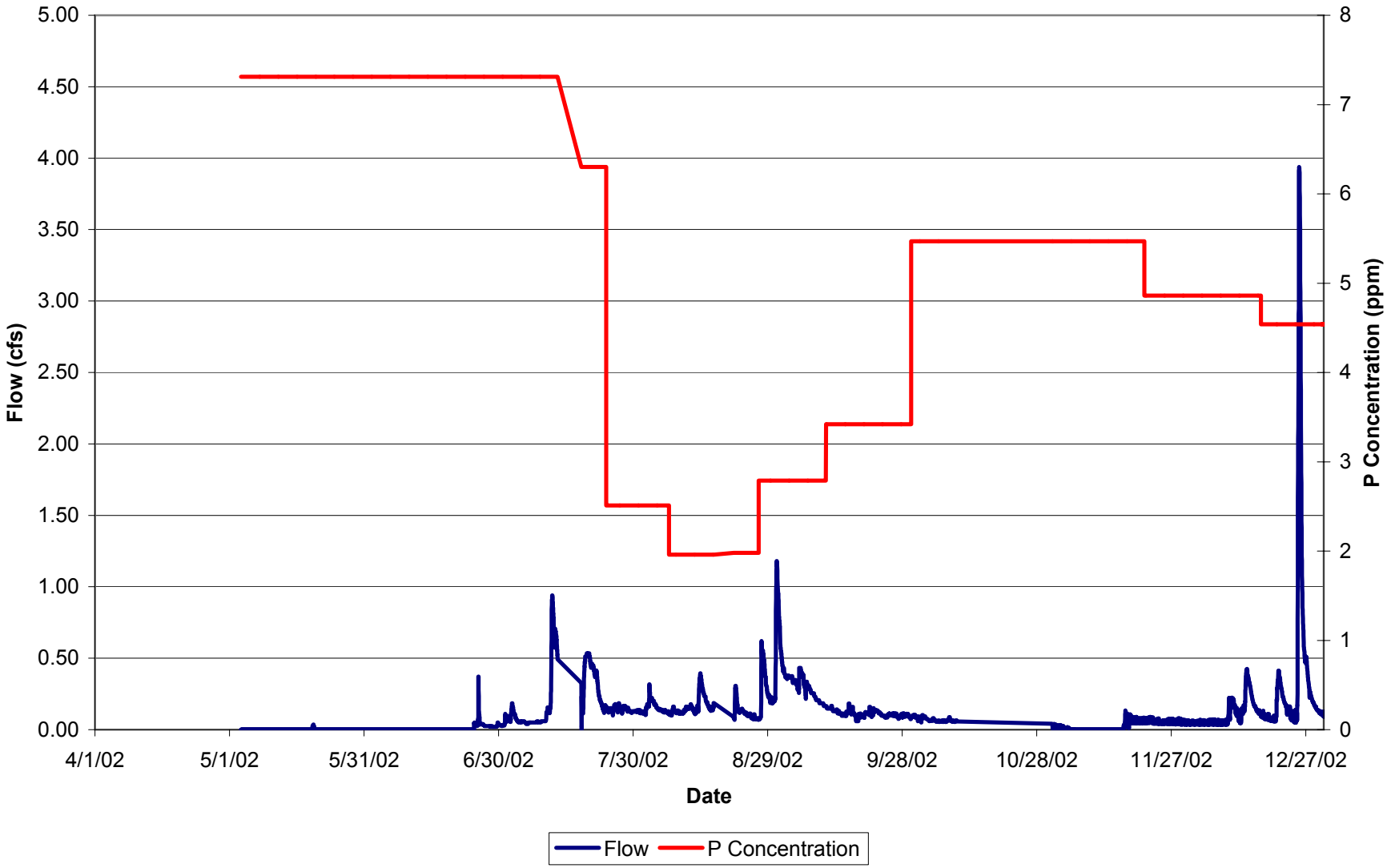


Figure A-27. Total P Concentrations at Monitoring Sites

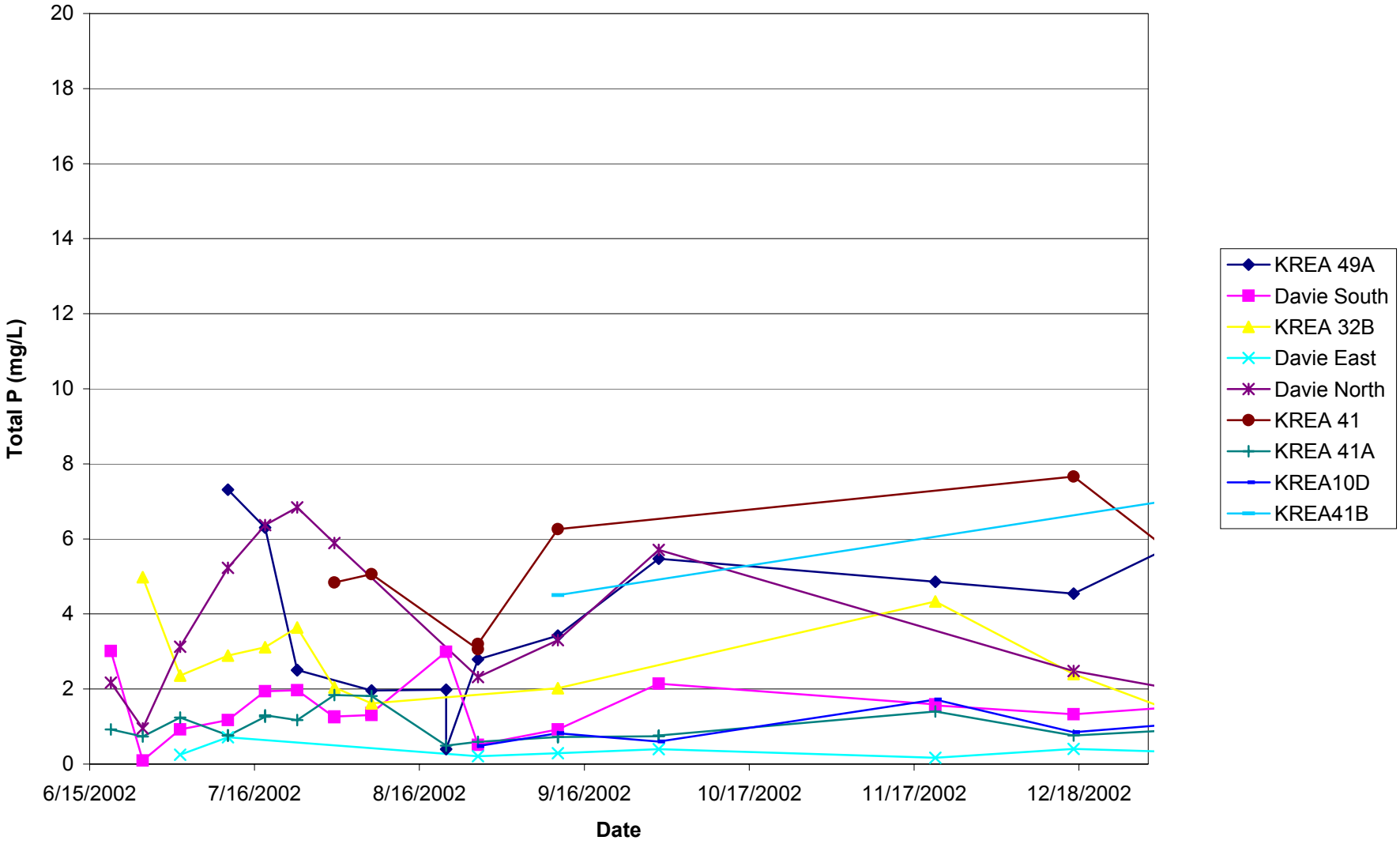


Figure A-28. Fecal Coliform at Monitoring Sites

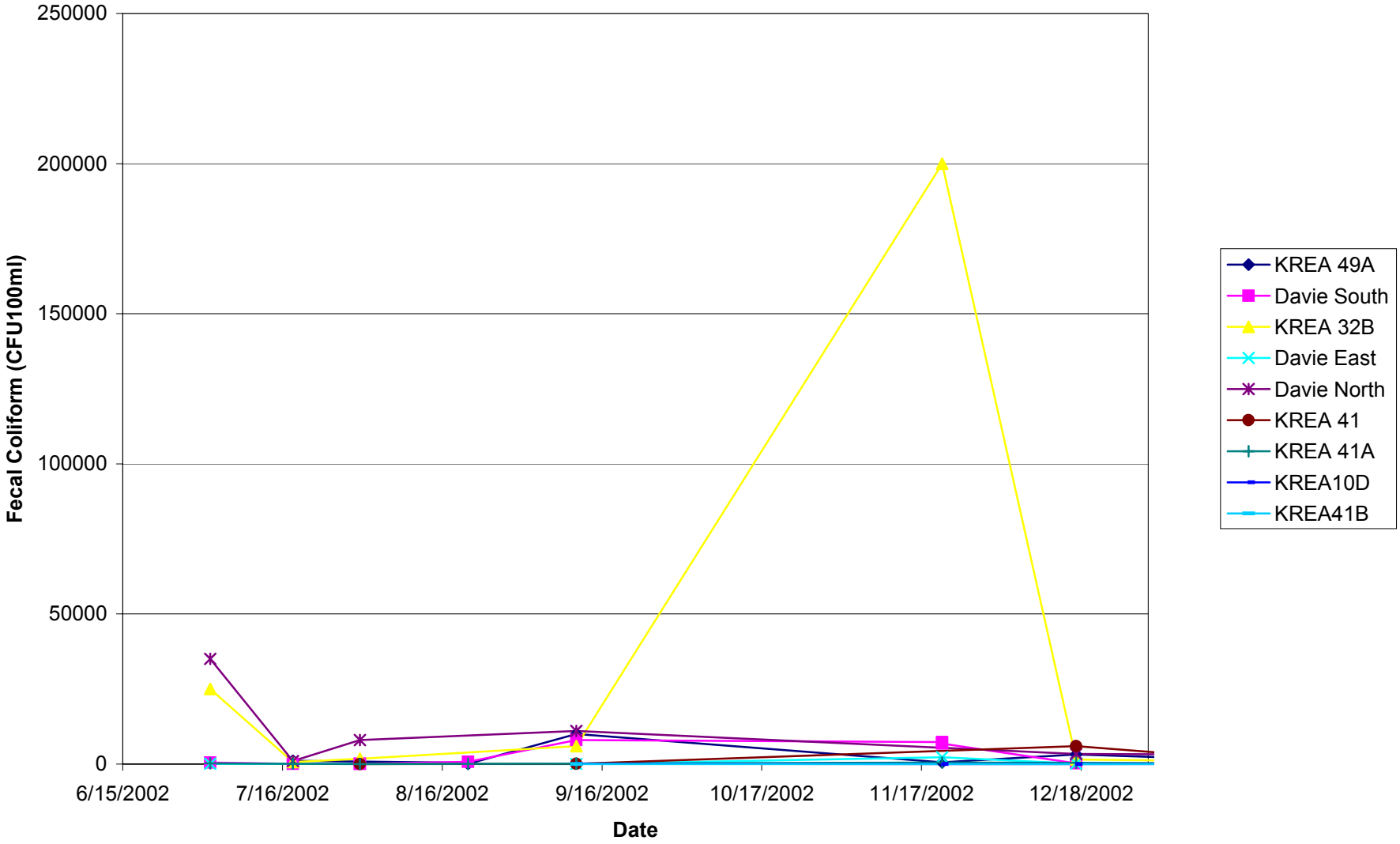
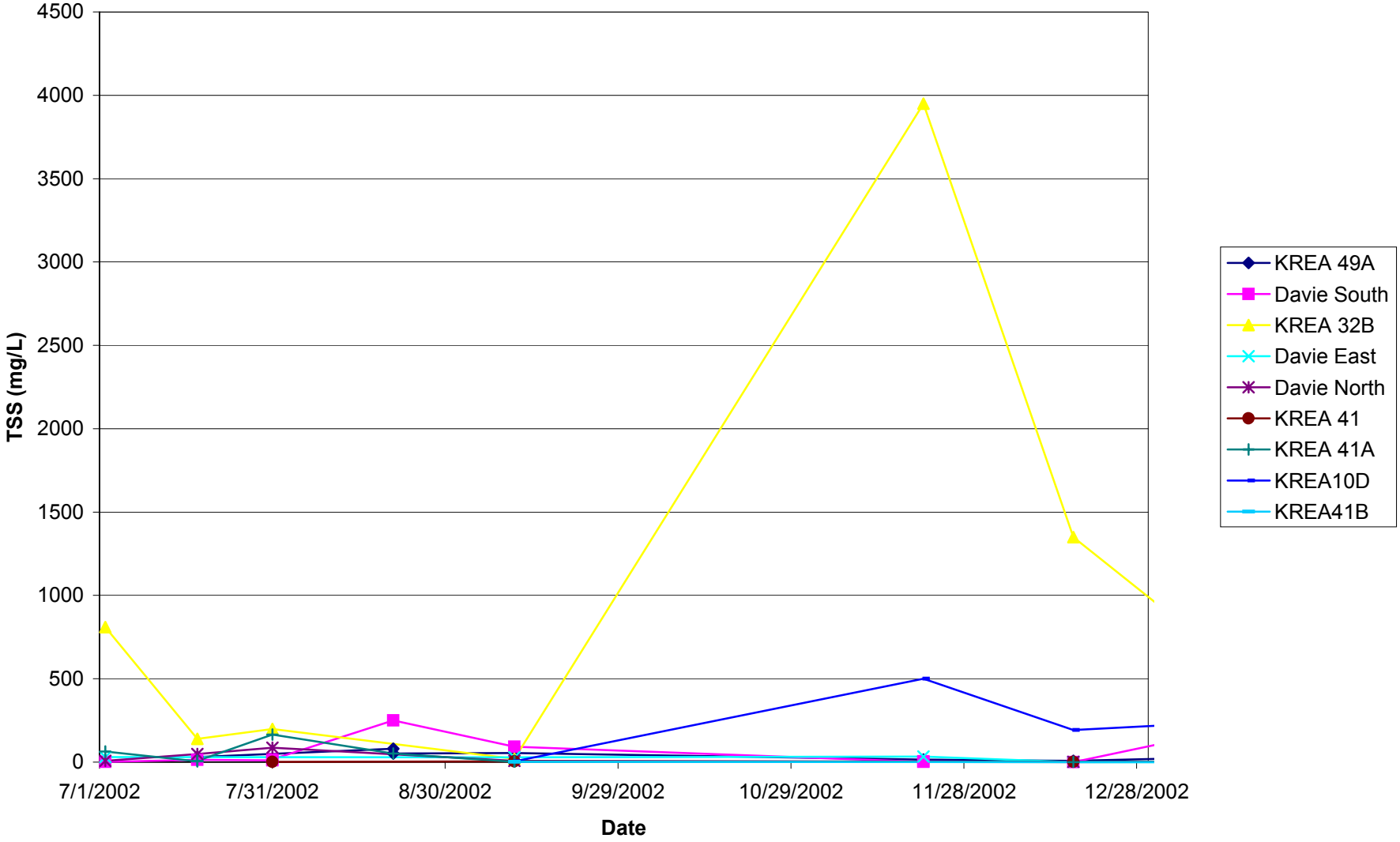
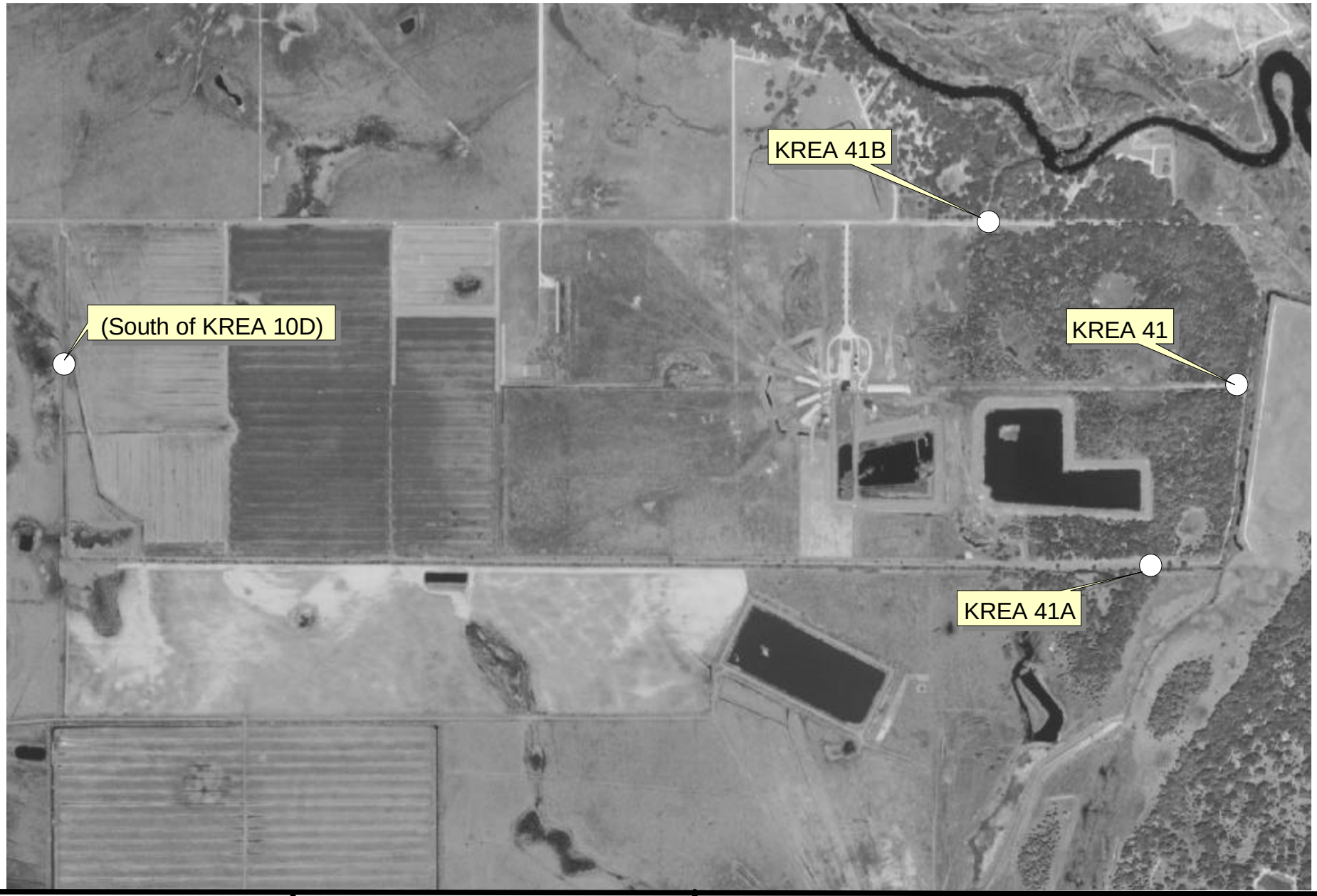


Figure A-29. Total Suspended Solids Concentrations at Monitoring Sites



APPENDIX B

UPDATED SITE MAPS WITH MONITORING LOCATIONS



Prepared By
SWET, Inc.

Dairy BAT Monitoring Sites at Butler Oaks Dairy

0.1 0 0.1 0.2 0.3 Miles

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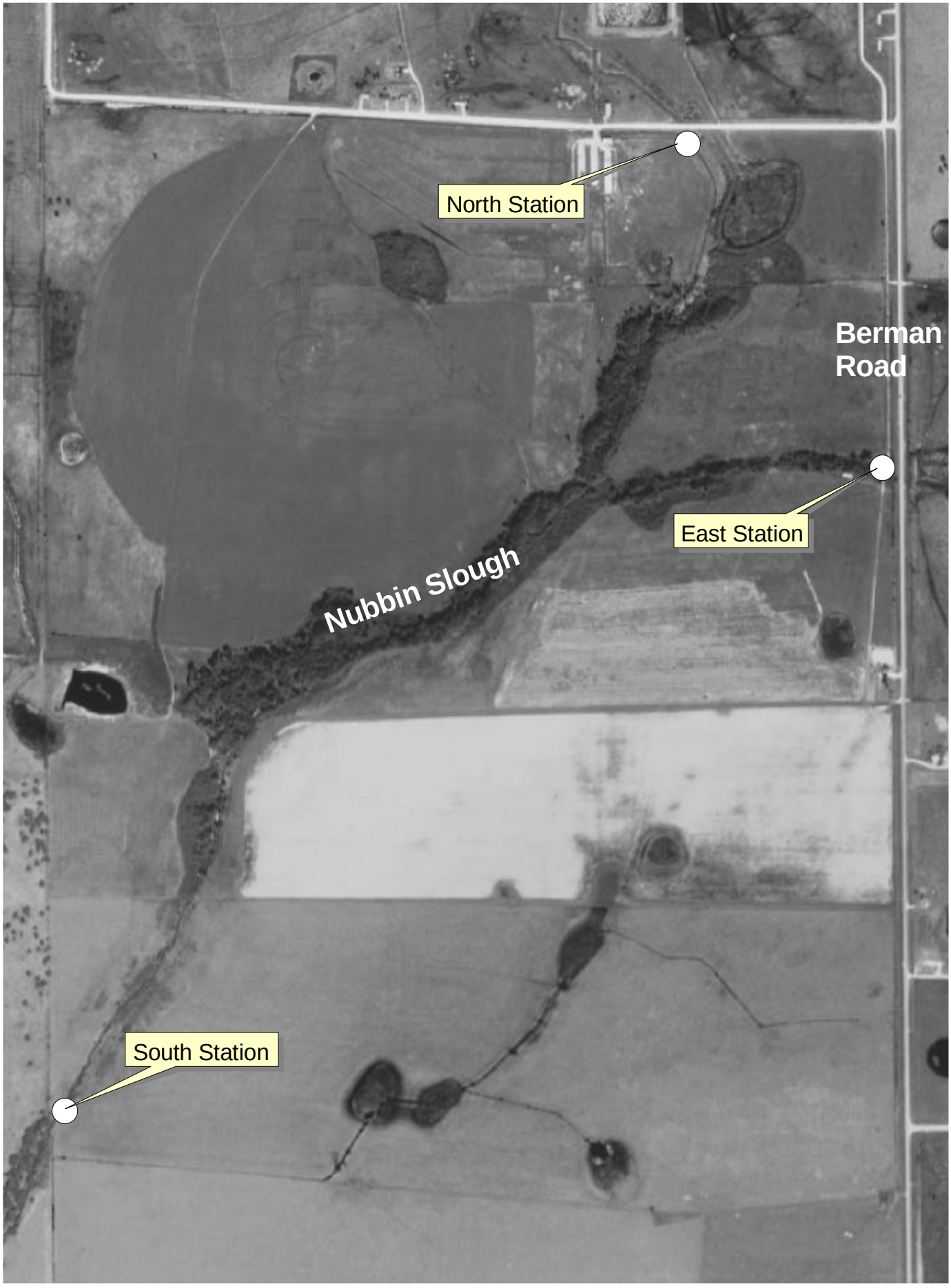

Prepared by SWET, Inc.	Dairy BAT Monitoring Stations at Davie Dairy	0.1 0 0.1 Miles

Prepared by SWET, Inc.	**Dairy BAT Monitoring Sites at Dry Lake Dairy**	**0.2 0 0.2 Miles**